MacUser

COLOR!

- Separations
- Graphics Applications
- The Interface
- The SE and Plus

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The Color of Information

What color is information? It's an absurd question, because information can take on so many different colors and forms. And that's just the point: Information isn't only black and white. If a picture is worth a thousand words, a black-and-white picture may be worth only a few hundred words, maybe less. Sometimes color plays such a critical role that the color itself contains most of the message — for example green means go and red means stop. Knowing the information content of those two colors can be a life or death difference when you come to a stoplight.

Here's an example of the important role color plays not only in conveying information but also in its retention. Studies of learning behavior reveal that when subjects are shown colored pictures of fruit, they recognize them more easily than when shown black-and-white pictures of the same group of fruit. Obviously, color helps you distinguish a picture of an orange from one of a grapefruit or tell a lemon from a lime. More interestingly, it turns out that when subjects are taught the names of fruit in foreign languages, they learn most slowly when the words alone are shown, more quickly when the words are accompanied by black-and-white pictures of the fruit, and most quickly when the words are shown with color pictures of the fruit. This demonstrates that color is important in helping us learn.

Words and images help you learn and remember things better than words alone; most Mac users are quite familiar with this principle. What's interesting is that color, too, plays an important role in the conveying, learning, and remembering of information. Just think of the many ways that color contains information. Red numbers in financial reports and spreadsheets usu-

ally represent negative numbers and bad news. Red, yellow, and orange can all be associated with caution or warning. Blue is associated with coolness, and green with money and envy. It's well known that the color of a room or painting can affect your mood, even though you might not be aware of it. Color also plays an important role in displaying scientific information. Until the advent of the Mac II, scientists who needed color couldn't use the Mac. For example, there was no way to make a hydrogen atom yellow or an oxygen atom blue when building a model of a molecule.

Learning to use colors effectively requires a combination of art and science. That's something we study intensively in the magazine business; we're all acutely aware of how important color is to a magazine. Books on graphics design, product marketing and display, and industrial psychometrics all take advantage of color's role in the perception of information.

So to truly enrich the information-processing powers of your computer,

you need to consider the implications of color. And to help you, we've put together this month's special report on color. Here you'll find out about color and the Mac (and human) interface, color separations, and the latest entry in the color-paint sweepstakes — Studio/8 from Electronic Arts.

If you don't have a color monitor on your Mac, that doesn't mean you shouldn't be thinking in color already — Macs with black-and-white monitors can be used with software that can manipulate color objects and create color output. Ultimately, however, I think that color is so important that most serious Mac Plus and SE owners will eventually upgrade to a Mac II family computer. Then the issue won't be black and white versus color, it'll be 8-bit versus 24-bit versus 32-bit color. In fact, most Plus and SE owners I've talked to see a Mac II in their future; it's just that the price is too high right now for most people (see Jim Seymour's views on this in Mainstream Mac). I expect Apple will provide some price relief in the Mac II family fairly soon, which will signal the start of a large migration of current Mac Plus and SE users to the Mac II and to more colorful Macintosh experiences.

WHAT'S NEXT?

Steve Jobs, with another shining example of his unique brand of high-polished hoopla and hype, rolled out his NeXT computer in San Francisco last October. Now that the confetti has settled, I think it's time to assess what the NeXT machine means to the Mac. First off, I don't think NeXT is an attempt to be the next Apple; it's more like an attempt to be the next Sun or Apollo. And a lot of things have to go right for Steve Jobs if NeXT is to be even half as successful as Sun or Apollo. Here's my analysis:

The machine is basically a nice piece

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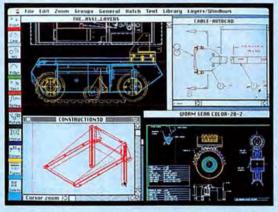
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***Byte Magazine* Review, January, 1988**

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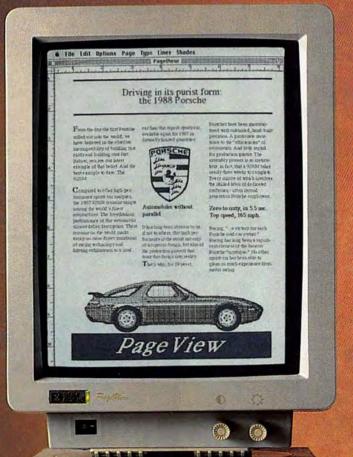
of hardware, but Jobs has overstated its case in a few areas. One of the claims that Jobs made was that the NeXT computer contained a mainframe computer on two chips. Not really. The two chips in question have no mainframe CPU, RAM, or operating system; they're really just I/O processing chips that have some design similarities to a mainframe. The com-

> **T**he announcement that NeXT and IBM are cooperating to allow NeXT software to run on future IBM computers is a seemingly dark cloud for Apple that actually has a silver lining.

puter has three processors: a 68030 CPU, a 68882 floating-point math processor, and a 56001 digital signal processor, all from Motorola. Although Jobs claimed that signal processing was an innovation for microcomputers, it's actually been around for a while. In fact, a signal-processing board that has a more powerful chip than the Motorola 56001 in the NeXT is available for the Mac II from Spectral Innovations (see "Interactive Cultures" in the October '88 issue). Signal processing is an important technology, and we'll keep you up-to-date about the Mac aspects of it in the months to come. It also seems likely that the 56001 will become available on a board for the Mac II.

Another misstatement was that the $2,000 NeXT printer is a PostScript printer. Actually the printer has no PostScript in it. The PostScript is in the NeXT computer system, and the computer processes the PostScript to create the image of the page and then

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ENTERTAINMENT

THE EDITOR'S DESKTOP

sends the bit map of the page to the printer. The printer even uses the same print engine (Canon SX) that's found in other low-end laser printers such as the HP LaserJet and the LaserWriter IISC.

And then there's the price. Although $6,500 is a lot of dough, the NeXT sounds like a lot of bang for the bucks. That should make you suspicious right away when you consider that the 8 megabytes of RAM included in that price sell for about half that. And remember that this price isn't offered to the general public. Initially, the NeXT machine will be available only to institutions of higher education and to developers. So if you're going to compare that price with the price of a Mac, compare it with the Mac's developer price, not retail price.

This black-and-white bête noire isn't any threat at all yet. By Jobs' own prediction, version 1.0 of the system software won't even be out until next summer, and Jobs doesn't expect the computer to reach peak popularity for many years. You can't even buy one as an individual until some unknown date in the future. Two important factors need to be considered: What will it really cost at retail? And what will Apple come up with in the meantime?

The announcement that NeXT and IBM are cooperating to allow NeXT software to run on future IBM computers is a seemingly dark cloud for Apple that actually has a silver lining. DOS developers now have another choice for developing their next-generation software, and IBM's Presentation Manager doesn't look as good as the NeXT system for developing new applications. In the end, any further fragmentation and confusion in the MS-DOS development camp helps Apple; the Mac is currently enjoying its moment in the sun as the best — and the best bet — computer for both users and developers. Let's hope it lasts a long time.

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4013	High Trek Mac Plus carry case	59.
4014	High Trek Mac SE & ext. kybd. case	69.
	Targus	
3618	ImageWriter II Carry Case	49.
3617	Mac Plus/SE Carry Case	59.
4015	Mac SE & Ext. Kybd. Carry Case	69.

OUR POLICY

- We accept VISA and MASTERCARD.
- No surcharge added for credit card orders.
- Your card is not charged until we ship.
- If we must ship a partial order, we never charge freight on the shipment(s) that complete the order.
- No sales tax.
- All U.S. shipments insured; no additional charge.
- APO/FPO orders shipped 1st Class Mail, charged by weight.
- Allow 1 week for personal and company checks to clear.
- COD max. $1000. Cash or certified check.
- 120 day limited warranty on all products. Defective software replaced immediately. Defective hardware repaired or replaced at our discretion. All items subject to availability. Prices subject to change without notice.
- To order, call us anytime Monday through Friday 9:00 to 9:00 EST, or Saturday 9:00 to 5:30 EST. You can call our business offices at 603/446-7711 Monday through Friday 9:00 to 5:30 EST.

SHIPPING

Continental US: Barring massive computer failures and other natural or unnatural catastrophes, all non-C.O.D. orders phoned into MacConnection by 8 PM EST will ship Airborne the same night for next day delivery, except for those within UPS Ground Zone 1 (which is also an overnight service). The total freight charge on any order placed with MacConnection is now $3. Backorders will also ship Airborne overnight at no additional charge. Some areas require an additional day delivery.
Hawaii, Alaska and Outside Continental US: Call 603/446-7711 for information.

"My mouse died."

"Gentlemen,

"My mouse died. I needed a new one. I had recently read your magazine ad about overnight shipping.

"I called you at 3:30 PM on Wednesday to order a new mouse. When your salesman, Robert, said, 'Look for it tomorrow,' I thought, 'Uh huh.' But the next morning at 9 AM I signed for it during my morning coffee. Only 18 hours later. I couldn't believe it.

"Congratulations and thank you."

Foster C. Wilson

Foster C. Wilson
Newark, OH

MacConnection™
1-800/622-5472

Letters

Stuart Fischbach of Webster, N.H., points out that "the picture of the Radius Accelerator 25 on page 82 of the October '88 issue is backwards. Or," he asks, "Is the picture intended for Mac users in the Southern Hemisphere?"

We read all your letters, backwards and forwards. Send them to Letters to the Editor, c/o MacUser, 950 Tower Lane, 18th floor, Foster City, CA 94404. All letters become the property of MacUser, and we reserve the right to edit any letters we print.

TRUE COLORS

Nice article by Aileen Abernathy and the Labs staff on color monitors (October '88). However, I was astounded by the little blurb below the picture of Baby Elizabeth on page 239. You actually have a monitor that "can display 16.8 million colors on-screen *at the same time*"?!? A color monitor with 4,096 x 4,096 pixels? Far out!

Incidentally, I used to have a TV set that (after the video section blew) could only display 1 (one) pixel, 19 x 19 inches, in white only.

DAVE M. CONLEY
SANTEE, CALIF.

Baby Elizabeth looks much better in 24-bit color. This picture, generated from the same TIFF file as the 8-bit version, is displayed with RasterOps' 24-bit color card. Because RasterOps uses 8 bits each for red, green, and blue, you can display 16.8 million colors on-screen at the same time.

JUST YOUR TYPE

I must take exception to Jim Seymour's September '88 column on "A Descent into Font Hell." Mr. Seymour seems to think that only Adobe fonts (and possibly Compugraphic in the future) are worth buying.

My company, Software Complement, sells a line of PostScript fonts called Complementary Type whose faces have excellent quality in regard to the shapes of the characters and their spacing. Our faces look great at small or large point sizes, and I suggest that Mr. Seymour examine them closely. To make such a blanket statement as Mr. Seymour made, without inspecting all other fonts on the market, is an injustice to the small manufacturers of high-quality products. If his attitude that only large companies can produce quality work was correct, Apple would still be in a garage and Mr. Seymour would be writing for some other magazine.

KAREN L. COHEN
MATAMORAS, PA.

A DVOTE FOR DVORAK

I was amused by the letter and your insightful response in the October '88 *MacUser*, where a reader berated the Dvorak keyboard by quoting a highly controversial "study" published in *Byte* which showed that the Dvorak layout "only" reduces finger travel by 28 percent.

The merits of the study notwithstanding, reduction in finger travel is only a small part of Dvorak's benefits. Ease of learning (AEtna Life & Casualty has been getting new typists up to their target of 25 wpm in 14 hours on the Dvorak), ease of use (a combination of reduced finger travel and reduction of "hurdles" — try typing *minimum* on QWERTY and you'll get the idea), a reduction of errors and typist fatigue, and an enormous in-

crease in typist productivity are well-proven advantages.

Any of your readers interested in getting some straightforward information on the Dvorak keyboard should send a stamp to Dvorak Developments, P.O. Box 1895, Upland, CA 91785 for a free sample of their newsletter.

RANDY CASSINGHAM
UPLAND, CALIF.

BEYOND BEYOND DARK CASTLE

In the September '88 issue, one of your Quick Clicks reviewers was not exactly pleased with a new game from Spectrum HoloByte, PT-109. In fact, he gave it a one-mouse rating; I think it's one of the better simulators, aside from maybe Falcon.

I also noticed your review of Beyond Dark Castle in the August '88 issue; it's rating was only three and a half mice. In the original review of Dark Castle, your writer claimed that a better game couldn't be made, and yet you expected better. But the writer of the BDC review said that it was exactly the same as Dark Castle, only with more rooms and a Save Game feature. So how does this constitute a lower rating than the original game? How do your reviewers justify their game ratings?

Your magazine has dozens of sections for types of software: Hyper-Card, DTP, etc., and you occasionally have "mini-mags" for CAD, music, and other topics. Couldn't you have one of these for games? None of the above sections are ever devoted to "entertainment."

JON MCNEAL
SEATTLE, WASH.

When a product is reviewed — a game or other software or hardware — it is always put in the context of what has gone before. PT-109 might have been deemed excellent three or four years

Letters

ago but is now considered old technology. To a lesser extent, the same holds true with Beyond Dark Castle. While the situation has changed, the premise and gameplay remain the same. It's sort of like a sequel to a hit movie. The second film is more than likely going to be only a shadow of the original; the second installment may be just as good, but it was the initial release that sparked our interest and that we re-

> **Y**ou equated someone being offended by adult ads with someone being offended by the mention of MS-DOS . . . come on now! Get serious!

member fondly. What follows is almost always going to be "more of the same." As to an entertainment section, look in the back of the magazine for Scrapbook, which is both entertaining and covers some of the latest games.
— BT

OBJECTIFICATION OBJECTIONS

Your response to Deborah Mason's letter protesting the adult graphics advertisement in MacUser Marketplace was not very satisfying. *Adult entertainment* is usually a euphemism for *misogynist entertainment*, which is based on objectifying women, treating them as objects.

Objectification of women means seeing them as less than human. It is hurtful; it limits the humanity of men and women trying to have decent relationships; it makes the world less safe for your mothers, daughters, sisters, wives, lovers, and friends, because people who see women as objects instead of as people are less hesitant to do them harm.

You might compare sexist advertising to racist advertising; my guess is that you wouldn't knowingly carry the latter. And if you mistakenly let something of a racist nature slip by you, you'd simply apologize and move on, rather than offering a trivializing defense that belittles the thinking of the person who pointed the error out to you.

You could choose to become an ally to women on issues like this instead of defending the indefensible.
LAURA NEWTON
TALLAHASSEE, FLA.

After reading your response to "Unadulterated Ads" in the October '88 issue, I was sorely disappointed. In her letter, Ms. Mason seemed to be writing about a legitimate moral concern she had about the content of your publication, i.e., is an ad for pornographic material appropriate for a computer-oriented magazine?

You equated someone being offended by adult ads with someone being offended by the mention of MS-DOS . . . come on now! Get serious! Your statement gives the impression that bringing home your favorite MS-DOS program for your wife and daughter to look over is no different than bringing home your favorite porn star for them to look over. If you apply that same loose logic when you review and evaluate software, then I would question if your five-mouse rating really means anything.

Your implication that because the advertiser has repeated his ad several times it is therefore acceptable doesn't carry much weight. "Money talks" isn't a very good editorial policy. Whatever happened to integrity?! One wonders if the "money talks" policy affects the five-mouse rating.

One thing I will agree with is that we all have to depend on our own sense of decency to help us decide where to draw the line. It's unfortunate that you "pass the buck" and force your readers to draw that line where you will not.
VIRGIL BOWDEN
SALT LAKE CITY, UTAH

Just say

You've known us as AppleCrate. We are now Crate Technology. So, just say Crate!

We offer a great line of external disk drives now known as MacCrate ranging from 20MB to our performance driven 80MB model all using Seagate quality disk drives.

We have expanded our product line to include InnerCrate: our solution for your Mac SE and Mac II internal disk

drive needs. InnerCrates range from 30MB to our high performance 300MB model.

Introducing TapeCrate, our high speed quality backup system. TapeCrate's high speed data transfer rate, protects 60MB of your valuable information in just 12 minutes. TapeCrate comes with a 60MB data cartridge and is ready for "Plug and Play" operation.

CRATE

Letters

I would like to reply to Ms. Mason's letter. I am offended by the Bible Search Software advertised in *MacUser* but would not deny anyone the right to advertise or use it. Also, Ms. Mason uses the word *sexist* — how does she know that all of the adult graphics are of women? If we could all learn to be a little more tolerant, this would be a better world.
STEVE DAMASCUS
DES PLAINES, ILL.

I didn't say everyone in Marin County has a Mac. I said everyone in Marin has a BMW, except me.

ARTISTIC DIFFERENCES

I want to thank you for writing an article about me ("Portraits of the Artists," October '88) that was truthful and humorous without making me sound like "Mr. Potatohead" — the guy on the left.

I do have one correction, however: I didn't say everyone in Marin County has a Mac. I said everyone in Marin has a BMW, except me.
DAVID SMITH
SAUSALITO, CALIF.

HOLD THE PHONE

Yesterday I experienced one of those things that make life worth living. I was able to obtain your September '88 issue at a store in Vienna, Austria, where I just recently have been posted as a communications engineer with the Royal Norwegian Embassy. I would like to use this opportunity to add a few comments to the Quick Clicks review of HyperDialer.

This device is restricted to use with regular two-wire phones. It will not work with so-called proprietary phones. These are feature phones designed to work with one particular phone system. These phones, more often than not, use digital signaling or separate wires for signaling and voice transmission, and therefore are unable to interpret the tone signaling from the Mac.

Worth mentioning is the fact that many phone systems do use regular phones. One is then in fat city right away.
CARL FREDRIK LEHLAND
VIENNA, AUSTRIA

A SWITCH IN TIME

This is a thank you to *MacUser*, the Boston Computer Society, and a swift accountant in Boston.

In the September '88 installment of The Help Folder, you folks published a desperation letter of mine, discussing my fruitless efforts to replace the missing programmer's switch on my Macintosh SE. Well, the advice that you folks published in response to the letter was great, but something even better happened. The morning after I had seen my letter in your magazine, Samuel Levenson, the aforementioned Boston accountant, called me up out of the blue.

He told me to stop by his office that afternoon, that he had just read my letter in *MacUser*, and that he had a programmer's switch that he wasn't using. Well, I went by and, sure enough, he had it and gave it to me.

My question was, how did he find my unlisted phone number? Well, it pays to belong to a user group. He called up the great people at BCS, and they helped him out immediately. I am

WHY NO OTHER INEXPENSIVE LASER PRINTER CAN PRINT THIS STATEMENT.

At $1999, our Personal LaserPrinter (PLP) costs about $800 less than Apple's Laser-Writer® II SC.* But that's the least of many good reasons why you should buy one.

One of the best is demonstrated, in rich and varied prose, above.

The PLP is the only laser printer in its category that lets you print in any number of point sizes, even fractionals. The LaserWriter II SC, by contrast, lets you print in any number of point sizes as long as the number is six.

The PLP gives you unlimited free-dom in reducing and enlarging documents (critical for applications such as Excel and PageMaker*). The LaserWriter II SC doesn't.

With the PLP, italics are true *italics* and bolds are true **bolds** —because the PLP uses true outline fonts. The LaserWriter II SC doesn't.

All this begs an obvious question: how can we offer so much functionality and still charge less for it?

The answer is software—software that enables your Macintosh to use its own resources to do the processing that would otherwise require costly additional hardware.

But there's another reason the PLP performs better: it has to.

After all, in a market saturated with laser printers, there are plenty of opportunities to compare price and performance. The PLP simply provides a higher standard of comparison.

For a PLP demonstration—or information on our ImageWriter® trade-in program—see your authorized GCC Technologies dealer. For the one nearest you, call (617) 890-0880.†

GCC TECHNOLOGIES

I KNOW THAT REPORT IS IN HERE SOMEWHERE.

And GOfer is just the one to track it down. GOfer digs through files at blinding speeds to bring up text in seconds.

A phrase, a fact, a note, a date. If you need it, GOfer finds it.

Even among countless files, GOfer software searches out the information you need with just one or two words, even if the correct spelling slips your mind.

"The most exciting and essential add-on since Sidekick. A must for anyone who writes anything," says Tim Bajarin, columnist and commentator.

Unlike other text-retrieval software, you won't spend hours indexing or converting files before you can start searching.

Once GOfer finds a section of text, you can create a new file, maintain a list of found files or copy and paste into the document you're currently working in.

So if you need a certain document written to Bill

Smith that mentions "insurance" and "third quarter profits," just summon GOfer with one keystroke and give him the word. Within seconds, that document will be at your fingertips.

- Operates as a Macintosh Desk Accessory
- Not copy protected
- Finds text in almost any file including MacWrite, Microsoft Word, Microsoft Excel, Microsoft Write, Microsoft Works, PageMaker, Ready-Set-Go, HyperCard, MORE, ThinkTank and WordPerfect
- Performs complex searches using AND/OR/NOT and NEARBY

GŌfer™

GOfer is available at quality software retailers.

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very grateful to the three great parties involved with getting me that switch.
JAMES GARVIN D'ANGELO
BROOKLINE, MASS.

TOP PUN

I admire what you folks do — employing people who otherwise would be unemployable is a noble thing to do. I refer of course to the people who write your headlines. I counted 64 bad puns in the headlines and subheads of your October '88 issue, and I probably missed a few. I can't think of any other

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> I counted 64 bad puns in the headlines and subheads of your October '88 issue, and I probably missed a few.

---

line of work in which people could make money doing that. Oh, and the Scrapbook section is pretty funny.
MATTHEW DIXON COWLES
ST. LOUIS PARK, MIN.

Even we have our limits; we do occasionally nix a headline. One of the "outtake" headlines for an upcoming feature surveying the wide world of utilities, cdevs, and inits was "Utili-Tea and Sympathy for the Cdevil Init Miss Jones." (You can blame Jim Bradbury for that one.) And then there was Russ Ito's persistent (but, ultimately, unheeded) plea to name our new A/UX department "The A/UXidental Tourist." No one will fess up to having originally proposed "The Unerasable Being of Lightness" for a piece on write-once optical media. Sometimes, however, the headline comes first. As soon as we manage to write it, we've got the name ready for an exposé on the market forces driving the memory shortage: "Greed, Megs, and RAM." — JZ

Novell presents a net
even the pickiest

Macintosh owners have a reputation for being fanatical about their Macs. And rightfully so, when you consider the elegance of the Macintosh user interface.

So when Novell set out to network the Macintosh with PCs, it was with one clear caveat: preserve the Mac environment. Create network software that would feel right to the pickiest of all Macintosh users. And none are pickier than the ones at Apple.

Full AppleTalk compatibility. Working directly with Apple, Novell's programmers created a version of NetWare® that is compatible with the AppleTalk File Protocol (AFP). It's an

achievement hailed by Apple President and CEO John Sculley as "a very significant event for the industry." And it means that Mac users can now get all the power and flexibility of the number one local area network in the world, without sacrificing any Macintosh functionality.

AFP compatibility also means that NetWare for Macintosh will be fully compatible with future Macintosh hardware and operating system versions. So you can take advantage of new Macintosh product releases as soon as they become available.

Freedom to choose. NetWare for Macintosh lets you connect Macs with a

work made to satisfy Macintosh user.

myriad of PC, minicomputer and mainframe environments, including OS/2. So you can choose the workstation environment that best suits your needs while communicating easily between dissimilar operating systems and sharing files and peripherals.

You get all the performance, security, fault tolerance and functionality of NetWare without changing the way you work with your Macintosh. And you get the power to transparently connect to over two million NetWare users worldwide.

To satisfy your need for a powerful Macintosh network, plug into NetWare—the

network that passed the ultimate Mac test drive. See your Gold Novell Authorized Reseller, or call 1-800-LANKIND.

For more information, call from your modem 1-800-444-4472 (8 bit, no parity, 1 stop bit) and enter the access code NVMC16.

NNOVELL

For network solutions, you should be seeing red.

A tablet for all reasons. The Personal Writer PW15SL combines the functionality of a mouse, keyboard, and graphics tablet in one device.

Getting Personal

Writing is a personal endeavor. So personal, in fact, that sometimes a computer — even a Mac — can get in the way. With that in mind, Personal Writer has released a new version of its digitizer tablet, the Personal Writer PW15SL (version 1.1).

The new Personal Writer PW15SL combines the functionality of a mouse, keyboard, and graphics tablet in one device. Among the user options are programmable macros; a dedicated touch zone, where your pen emulates a mouse; a graphics area; and handwriting-recognition capabilities.

In addition to all this, a Macin-Talk option has been included that makes it possible for users to hear what they're writing.

The Personal Writer tablet lists for $1,295 and is available from Personal Writer, 1801 Avenue of the Stars, Suite 507, Los Angeles, CA 90067; (800) 322-4744.

— *Russell Ito*

The Open File

Opening a document is usually a snap — that is, as long as you have the originating application. But for those instances when you don't, TENpointO has come up with Open It!, a print-to-disk and Scrapbook-replacement DA that lets users save their work in a common format that can be opened without the originating application. As a Scrapbook, Open It! can open MacPaint, PICT, Glue, and Scrapbook files, and it can also create multiple Scrapbook files. The files themselves can hold anything from a single graphic to an entire page. A scaling feature lets you size an image from 1 to 1,000 percent.

Print It!, the print-to-disk utility included with Open It!, lets you save a document as an Open It! file that other users can open using the Open It! Viewer utility that's also part of the package. Because the viewer is a public-domain utility, you can distribute it with your documents without violating any copyrights. Open It! lists for $79.95 and is available from TENpointO, 3885 Bohannon Drive, Menlo Park, CA 94025; (415) 329-0800.

— *Russell Ito*

Artificial Intelligence Extravaganza

The American Association for Artificial Intelligence (AAAI) held its 1988 national conference and gathering, AAAI-88, in St. Paul last August. For the first time, Apple and Mac IIs were a major presence on the exhibit floor. Apple's booth, a 1,200-square-foot showplace, was the third largest there (DEC and TI, major AI players, had larger booths). This was the first time Apple has exhibited at an AI show. And Mac IIs weren't restricted to the Apple booth. They could be found in many other companies' booths. In fact, excluding the numerous book and journal publishers, about 20 percent of the booths had Mac IIs as part or all of their hardware.

The TI booth had Mac IIs, the Xerox booth had a Mac II, the Gold Hill booth had Mac IIs, and the Symbolics booth had a Mac II. In fact, of all the major AI players, only IBM (no surprise there) and DEC (big surprise there) didn't have Mac IIs in their booths. DEC did show, on their own machines, a prototype version of DEC Decision Expert. This program wins, hands down, the 1988 award for the software that most looks like Mac software but isn't. If copying is the sincerest form of flattery, Apple should be very flattered (knowing Apple, though, I doubt that will be the case). And, to make a few compatibility points, Apple had a MicroVAX in its booth.

The center of Macintosh activity was, naturally enough, the well-designed Apple booth. The booth served two purposes. The first was to introduce people to the concept of the Macintosh and to demonstrate the interface and productivity applications. This is important at a show where many of the attendees have no Mac experience. The other purpose of the booth was to demonstrate a linked system of Macs working together at each stage of the AI development and delivery process and, at the same time, integrated with technical productivity software.

Among the non-AI products on display were SuperMac and PCPC color monitors, HyperCard products from HyperPress Publishing, the whole Claris software line (including FileMaker 4), and Ashton-Tate's Full Impact and FullWrite Professional. AI products included Cognitive Systems' Intelligent Customer Service Systems, LPA's MacProlog, Neuron Data's Nexpert Object, Franz's Allegro Common Lisp (running under A/UX) and Coral's Allegro Common Lisp (on a vanilla Mac II), TI's MicroExplorer, Intellicorp's KEE, Human Intellect System's Instant-Expert Plus, Gold Hill's Gold-Works II, and Gensym's G2. All the various companies staffed the stations with their own personnel. By simply spending half a day in the Apple booth, you could discover exactly where AI stands in the Mac environment and where it's heading. Apple even set up an area where you could take a relaxing break between demos. They set up a TV and showed a cycle of

all the fascinating videos that Sculley, Gassée, and Kay use during their talks.

The most interesting application not in the Apple booth was Flavors Technology's Bus-Link, which lets Mac IIs share the memory (and thus data) of many powerful minicomputers. It also gives Mac IIs access to VME-based machines, a necessity for most government contracts.

Expert systems are one of AI's current major application areas, and there were many different systems on display. The best system currently available for the Mac II is Neuron Data's Nexpert Object. However, if it wasn't the system for you, you could check out a half dozen other expert systems for the Mac.

The other major product field — this year — was development languages. You had your choice of several flavors of LISP and Prolog. I was particularly impressed with Coral's version of Allegro Common Lisp. Gold Hill's GoldWorks II for the Mac also looks to be a strong contender in the LISP market. Gold Hill's PC products are very highly regarded, and expectations are high for the Mac version. Neuron Data also introduced Nextra, which automates knowledge acquisition and provides a graphics model of conceptual information. Nextra runs on Pluses, SEs, and IIs.

Many AI products for the Mac also exist on other machines. Their interfaces often leave much to be desired in terms of friendliness, usefulness, and power. To combat these deficiencies, many products (and particularly expert systems) are going to HyperCard front ends. One HyperCard product shown is more than a front end. It's Intelligent Developer, published by HyperPress. Intelligent Developer has three parts: the program itself, for managing and storing knowledge; Intellicard for embedding expertise into HyperCard; and IntelliHelp for assisting nonprogrammers who are creating their own applications.

Also included is a high-level debugger.

On the hardware side, TI has further enhanced the MicroExplorer, and the Symbolics MacIvory card combines Ivory (which is a complete LISP computer on a single chip) technology with their Genera development software. And it all runs very nicely on a Mac II. It seems about as powerful as MicroExplorer and should be somewhat cheaper (for a full system).

AI is still a very young field. That doesn't mean that it's immature, however. A lot is going on, and there's a very healthy cross-fertilization between the hardware people and the software folks. This leads to an overall attitude of "let's get the job done." The Mac II is proving to be an ideal tool in this sort of environment. The cost of doing AI development on a Mac II-based (or even MicroExplorer-based) system is at least an order of magnitude cheaper than on any other machine. But the cross-fertilization in the field means that Mac II products are easily portable to the more powerful and vastly more expensive workstations. Developing AI products on the Mac makes good sense to many developers these days.

AAAI-88 is primarily a conference, not a trade show. During the week it ran, approximately 150 papers were presented and 20 half-day tutorials were offered. These were all technical, and very academic, presentations. Hardware was generally incidental. And while the Mac showed its power on the exhibit floor, it still has a long way to go in the research labs.

Still, there was little doubt in many of the attendees' minds that there was a Mac in their future. Many of the younger people were already using Macs for productivity work and were waiting for Mac IIs to begin AI work. By this time next year, Mac IIs should be well entrenched in AI research labs.

— *Jake Paden*

They aren't safety-coated for easy swallowing, but these ADB tablets from Kurta, Summagraphics, and CalComp might be the cure for mouse-o-phobia.

ADB ABC's for CAD

The market for mouse alternatives is growing, and developers are striving to build a better mouse so Mac users will beat a path to their door. Three companies are marketing tablets that plug into the ADB outlets on the Mac SE and II. These tablets provide *absolute positioning*, meaning that each point on the tablet corresponds exactly to a point on the screen. This improves hand-eye coordination, allowing more accurate freehand drawing and tracing and making the tablets ideal for applications such as CAD/CAM, graphics, and desktop publishing.

Kurta has three programmable IS/ADB tablets that should be available by the time you read this. Special scale keys let users map screen size to a specific area on the tablet, and the surface can be subdivided to accommodate more than one monitor. A menu strip across the top has 11 to 23 function keys that can be programmed with macro commands or keyboard shortcuts using QuicKeys, Tempo II, or System 6.0's MacroMaker. You can also

have the macros at your fingertips by using Kurta's Penworks cdev to program a 4- or 12-button cursor.

The tablets come in three sizes and can be used with either a stylus (included) or a cursor. Prices start at $395 for the 8½-x-11-inch unit. Contact Kurta, 3007 E. Chambers, Phoenix, AZ 85040; (602) 276-5533.
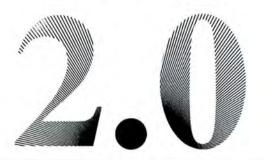
The Bit Pad Plus, from Summagraphics, is a 12-x-12-inch graphics tablet that comes with a stylus and a four-button cursor. It retails for $495. The software included lets you program certain features, such as scaling functions. Talk to Summagraphics, 60 Silvermine Road, Seymour, CT 06483; (203) 881-2000.

CalComp, a Lockheed company, is marketing the DrawingBoard (2300 series), three tablets designed mainly for CAD applications. Each tablet comes with a 16-button cursor that has 11 predefined Mac functions; styluses are also available. The tablet's software driver lets you use special command templates for VersaCAD and other programs. The tablets come in three sizes and prices, beginning at $625 for the 12-x-12-incher. Fore more info, CalComp, 2411 West La Palma Ave., Anaheim, CA 92801; (714) 821-2000.

— *Aileen Abernathy*

NEWS *L I N E !*

EDITED BY GIL DAVIS

SPA Stopping Piracy

LOS ANGELES — The Software Publishers Association (SPA) won a preliminary injunction against two Los Angeles computer dealers: P.C. Plus Corporation and California Computer Distributors, for allegedly distributing copies of software on hard disks. The legal action stemmed from an investigation paid for by the SPA's Copyright Protection Fund. Recent contributions to the fund came from Claris Corporation and IBM.

Apple to Lose Yocam

CUPERTINO, CALIF. — Delbert Yocam, president of Apple Pacific and Apple Education, has resigned and given a year's notice. His Apple Education responsibilities will be taken over by Allan Loren, president of Apple USA. Yocam has been with Apple since 1979. During his remaining time with Apple, he plans to help its Pacific division catch up with Apple Europe.

TOPS Gets InBox

ALAMEDA, CALIF. — TOPS, one of the largest suppliers of Macintosh network software, acquired the popular electronic-mail program InBox from Symantec Corporation. InBox will be bundled with TOPS for the Macintosh by early summer. TOPS' chief competitor is expected to be Microsoft, which is developing its own second-generation E-mail system that will send messages from within applications.

Apple Seeks Customer Satisfaction

CUPERTINO, CALIF. — Customers of Apple dealers can expect more service if Apple's new Infrastructure Fund works as planned. The fund lowers the prices dealers pay for Apple products if they provide customer services such as on-site training and demonstrations, and employ systems engineers, trainers, and target-market executives.

Thin Bits . . . A new Mac is produced every 25 or 30 seconds in **Apple's** new Singapore plant. Previously, all Macs came from plants in Fremont, Calif., and Cork, Ireland. . . **Access Technology,** publisher of Trapeze and MindWrite, has been purchased by **CompuServe**. . . **Apple** had sold two million Macintosh computers into the U.S. market as of last June, according to Dataquest. If trends continue, Apple could rack up 1.3 million Mac sales during calendar 1988 alone. . . **INDIVIDUAL Software, Inc.** acquired **Macropac International,** which publishes 101 Macros for Excel and 101 Scripts for HyperCard. . . **Apple** has invested in a multimedia company: **Digital F/X, Inc.** The two-year-old firm produces a $125,000 digital video production system. . . **Palantir Corporation** of Santa Clara, Calif., a company that produces high-volume optical-recognition servers, has changed its name to **Calera Recognition Systems** to avoid possible confusion with **Palantir Software** of Houston, the software publisher.

Speaking Out: First Reactions to NeXT

Steven Jobs, who helped create the Apple II and the Macintosh, recently introduced a third computer, called the NeXT, which is the first product from his company of the same name. This $6,500 black box is initially aimed at higher education markets but could end up competing against the Mac. We asked members of the Macintosh community for their comments on how the NeXT computer might challenge the Mac:

"I got a chance for a little hands-on with the NeXT machine, and I do very much like the feel of it. It has a large screen and four levels of gray, which makes the desktop look much more elegant. By comparison, it made the Mac feel like a toy. On the other hand, by the time the NeXT computer has enough applications, it may have lost its technological edge.

"I think the most direct effect of the NeXT introduction will be to push Apple to improve its hardware and to advance the Mac's look and feel, without sacrificing the Mac interface."

— *Raines Cohen, cofounder of the Berkeley Macintosh User's Group and Boston Computer Society*

"I don't think the NeXT computer will make a major impact until they're cranking them out like hotcakes and people are snapping them up. By that time, a lot can change.

"I think Apple is watching NeXT very carefully. Its computer-design group wants to leapfrog the NeXT machine by the time NeXT is shipping in quantity.

"The NeXT computer captures the imagination of software developers who want to write for the machine because it's fun. If Jobs can't capture the attention of developers, no one can."

— *Derek van Atta, CEO, ComputerWare*

"I don't see the NeXT computer having a big, major, negative impact on the Macintosh. The NeXT is more akin to a Sun workstation.

"As a software developer, higher education doesn't interest me because it's not a big enough market. I learned the hard way with the Mac: There wasn't a market until we reached a million Macs. NeXT is talking about 30,000 per year — at that rate, it would take a long time to reach critical mass. But I'm willing to take a look at it, once it's proven out."

— *Charlie Jackson, President of Silicon Beach Software*

"The average Mac user will be relatively unaffected by the NeXT announcement. Certain NeXT features would be nice to have on the Mac; I think we'll see them migrating to the Mac interface. First, we'll see hacks from programmers and then we'll see Apple adopting some of NeXT's ideas. But Apple is already working on these things."

— *Leonard Rosenthol, software engineer at Software Ventures and co-author of Microphone II*

How do you explain the magnitude of the new Microsoft Works?

Whether you run a small business or your knowledge about computers happens to be less than monumental, the new Microsoft® Works 2.0 has you covered.

Microsoft Works 2.0 is actually five tools in one: word processing, spread sheet, database, drawing and communications. But as far as you're concerned, it's one integrated program— so it's easy to move between the different tools and use them together.

In fact, from the moment you take it out of the box, Microsoft Works 2.0 is easy to use. It comes with an animated training program written in HyperCard® format. As well as on-line help and unlimited phone support to help answer any questions you may have.

You get five programs in one— and incredible efficiency when you combine their talents.

No matter how varied your projects are, Microsoft Works 2.0 can handle the job. Its newest feature, the drawing module (with page layout), can enrich otherwise plain, fact-filled documents with compelling graphics.

The word processor can create everything from a simple memo to a detailed report—and it even includes a spell-checker aimed at typos.

Of course, if your document needs to be supported with numbers, you can always jump over to the spreadsheet to compute and analyze data. And then transform it all into easy-to-read, easy-to-understand charts.
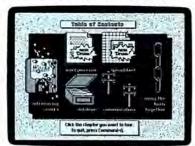
As for information that keeps your business going, the database is indispensable for keeping track of clients and orders.

And you can count on the communications module to bring information to your desktop through a modem.

If you'd like to learn more about Microsoft Works 2.0, just call (800) 541-1261, Dept. I75 for the name of your nearest dealer.

No wonder Microsoft Works 2.0 is the best-selling application in its class. Aside from being a great value, Microsoft Works 2.0 is one program that can handle a myriad of business needs.

It's that simple.

To help get you started, we've included an animated training program written in HyperCard format.

Microsoft®
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It's simple.

Everything you see above was created using some combination of the five tools within Microsoft Works 2.0: word processing, spreadsheet, database, drawing and communication. As you can see, the real power of Microsoft Works 2.0 comes into play when all the tools are used together.

TeleMaceting

Telemarketing is the junk mail of the '80s. We've all become familiar with the irritating telephone sales pitch, but now Magnum Software has introduced Teleflex, a telecom box that automates the process, making it possible for you to receive even more of those annoying calls without talking to a single human being.

The Teleflex system consists of a box that looks like a modem, and an associated software package. Depending on the software configuration, Teleflex can serve as a phone answering machine, voice mail system, telemarketing service, or modem. And since it can record and play back digitized sounds, it can make a call, then record voice replies — as well as using the more common telephone touchpad method of recording responses.

Although Teleflex comes with a number of templates, you can also create your own applications. The software uses an object-oriented graphics approach. Creating a script is as simple as dragging an icon from a palette onto a work area, then connecting it to another icon — there's no script writing involved.

Teleflex lists for $2,995 and is available from Magnum Software, 2115 Devonshire St., Suite 337, Chatsworth, CA 91311; (818) 700-0510.

— *Theodore Vail*

Still more annoying, automated calls may be coming your way courtesy of the Teleflex system from Magnum Software.

CLARIFICATIONS

Obfuscations obviated, ambiguities arbitrated, and errors eradicated.

APPLES ATTRIBUTED

If you liked them apples (the images, that is) in the October '88 MacUser Labs report "True Colors" (pages 244 and 255 through 262), you might like to know that they were supplied courtesy of MacroMind's Stuart Sharp.

BUG BLAMED

In the feature "Connecting the DOS" (September '88), we were unable to get PerfecTEK's MAC/DOS-SE operating properly as an MS-DOS coprocessor.

The problem was not with PerfecTEK's product but with a bug in the driver of the DaynaFile disk we were using in conjunction with the MAC/DOS-SE; we will evaluate the MAC/DOS-SE in a future issue.

Filling the Laguna Lacuna

To date, not even we know what the mythical Laguna laptop will look like. But for those of you who need a portable Mac now, Colby Systems has a couple of new possibilities.

The Walkmac Presenter is a 68000-based, battery-driven, 15-pound unit that can be configured with either a 40- or 80-megabyte hard disk. It uses a high-contrast (30:1) backlit LCD display that's detachable and suitable for use as an overhead projection panel. It also has a video output jack for the Radius and E-Machines large screen displays. An optional 1,200-baud internal modem and an accelerator board are also available. If you first load your application into RAM and then turn off the hard disk, the system can run for up to three hours on batteries. The Walkmac Presenter comes standard with 1 megabyte of RAM, and its expected $4,495 price tag buys you everything except the hard disk, which adds roughly another $900 (40 megabytes) or $1,300 (80 megabytes). Colby's other suggestion is the Walkmac SE. This SE-based model can be outfitted with either a 40- or 80-megabyte internal hard disk, and it comes with a backlit, supertwist LCD display (15:1 contrast) that measures 512 x 340 pixels. An optional 1,200- or 2,400-baud internal modem is also available. If you use batteries without a hard disk, Colby estimates the unit will run for two and a half hours. With the hard disk, that figure drops a half hour. The standard 1 megabyte of RAM can be upgraded to 8 megabytes, and Colby also offers a touch-pad option. For more speed, an accelerator board can also be added. Pricing hadn't been set as of press time.

To find out more, contact Colby Systems, 4723 N. Warren Ave., Fresno, CA 93705; (209) 222-4985.
— *Russell Ito*

PanoRAMic Data View

If you're still scanning the horizon for the right database program, you might want to eye Panorama, a new database manager from ProVUE Development. It's targeted for the user who doesn't use a relational database, doesn't have the time or experience to program, and who typically manages data sets of less than mammoth proportions. But Panorama isn't a scaled-down tool. For top access-speed, Panorama keeps an entire open database RAM-resident. The trade-off here is that a database is limited in size by your

Panorama's Data Sheet view is in the background. Partly covering it is a form that combines drink data from the database with a Flash Art glass.

RAM (a few megabytes at most) as opposed to your disk space (20 megabytes on up). But the program packs a lot into a little by using space-saving techniques.

Panorama's design window offers quick access to all field properties, including separate input and output formats; whether duplicate field values are allowed, required, or forbidden; special links (not relational) to other databases; whether a field should contain the value of the prior record's field; and a special property called *Clairvoyance*. If you type into a field that has Clairvoyance enabled, Panorama tries to guess what you're typing and automatically completes the entry for you based on a unique text string match.

Panorama's forms-design tools offer full editing freedom, and the inclusion of graphics in special Flash Art fields. Flash Art consists of named pictures stored in a special file. Only one copy of each art piece exists, but it can be referenced in any number of fields or databases. Data-entry forms can contain active charts that will automatically update as the data

are changed. Buttons that activate prerecorded macros can also be installed in entry forms.

Much of the sorting, selecting, query, and summary work is done with a few clicks while in the data-entry mode — without generating special reports. Frequently used commands appear in the menus and in the tool palette.

Panorama is so rich with features, you'd need a database to keep track of them all. It's available for $395, or as a $99.95 upgrade for registered OverVUE users, from ProVUE Development, 15180 Transistor Lane, Huntington Beach, CA 92649; (714) 892-8199.

— *Salvatore Parascandolo*

TPS Electronics' PC-685 lets you take serial output and convert it into direct ADB input. TPS also offers a number of magnetic-stripe and bar-code readers (like the one shown here) that work with the PC-685.

ADB — The Serial

When Apple adopted ADB as a standard, a lot of serial devices were left out in the cold. Digital scales, bar-code readers, and the like suddenly found themselves with nothing to talk to. But now, TPS Electronics has surged into the gap with the PC-685, a $495 converter box that lets you take

the output from a serial device directly into a Mac via an ADB port. The PC-685 is a compact metal box with a single serial input port and a pair of ADB ports at the rear. Among the serial devices TPS offers for use with the PC-685 are bar-code and magnetic-stripe readers. A major advantage of the

bar-code readers is their ability to store data in tab-delimited format, making it possible to download the data directly into a database or other application.

Contact TPS Electronics, 4047 Transport St., Palo Alto, CA 94303; (415) 856-6833.

— *Russell Ito*

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DA Database

In case you haven't noticed, database programs have been getting bigger and bigger recently. The folks at Preferred Publishers have come up with a novel alternative for people who don't need a huge, powerful database very often.

It's called DAtabase (no, that's not a typo). It's a functional database that's accessible as a desk accessory.

Just like its bigger relatives in the DBMS world, DAtabase lets you design your database to suit your needs and whims. Background pictures, picture fields, multiple type styles, calculation fields, time and date stamping, password protection, and custom-

DBMS without the MESS. DAtabase, from Preferred Publishers, is a full-function database that pops up as a desk accessory. It supports most of the functions you expect from large DBMSs, but in a smaller package.

report generation are all supported.

For $129.95, what more could you want?

You can reach Preferred Publishers at 5100 Poplar Ave., Memphis, TN 38137; (800) 446-6393.

— *Russell Ito*

Updates Update

As you've probably noticed, software and hardware aren't the only things that change with time. We're changing too.

A number of the goodies you used to find here have migrated to the back of the book (or the front of the book if you're reading the Hebrew edition). The Updates chart is now located in front of MiniFinders. The Dialog Box, Bug of the Month, and Applications Now Being Accepted are now in Scrapbook. And check the DTP, Hyperspace, and A/UX sections for information about new products in each of these areas.

Things are sure to keep changing, so stay with us. Version 1.0.2.3.4.5.6.7.89B17 is on the way.

RUMOR MANAGER

If computer speed turns you on, 1989 is going to be a great year. Right now, the fastest Mac pokes along at 25 megahertz (and the slowest at just under 8). That speed limit is going to be busted soon. Motorola is already producing 33-megahertz 68030s in quantity, and we all (at least you regular Rumor Manager readers) know all about Apple's plans to put 68030s in everything. So expect the 33-megahertz Mac soon. Motorola (those wonderful hot-rodders) have also started showing 42-megahertz 68030s and 33-megahertz 68020s (although we don't know who'd be interested in such old, slow technology). And the first 68040, which will also appear in 1989, is scheduled for a minimum speed of 50 megahertz, with 100-megahertz units hoped for. Now that's getting up to our kind of speed.

Speed does have its problems, however. The faster the CPU (the 68030 or whatever) runs, the faster the memory must be. You didn't know memory has a speed rating? Guess you don't have a Mac II then. The RAM that computers use is rated in terms of its maximum access time. This figure is typically given in nanoseconds (billionths of a second). Pluses and SEs with their slow 7.94-megahertz 68000s can use

150-nanosecond memory. The faster Mac IIs with their 68020 require 120-nanosecond (or faster) memory. The poor folks dealing with OS/2 on IBM's PS/2 line require 100-nanosecond memory. And, as you'd expect, the lower the speed number — the faster the memory — the rarer and more expensive the chips are. What all that is leading to is the unpleasant fact that the 33-megahertz and faster 68030s are going to need very fast memory: 80 nanoseconds for a speed of 33-megahertz, 60 nanoseconds for 42 megahertz. You think getting Mac II memory is hard now. Price out, if any one will quote, the cost and delivery times for 80-nanosecond SIMMs. Don't do that if your heart is weak or your doctor has advised you to avoid extreme stress. And for true angina, try finding 60-nanosecond, 1-megabyte SIMMs. Keep in mind that you'll probably need some within the next 12 months. Good luck.

Motorola R&D is well aware of the memory problems the fast new Macs will cause. And we hear they may have hit upon a solution. It's called the Memtran chip (for MEMory TRANsformer). It's a chip that acts like a transformer between the CPU and the memory chips, buffering and caching bits and bytes so that fast

CPUs can run at full speed with relatively slow (say, 100-nanosecond) SIMMs and thus obtainable memory. Right now the Memtran exists as an electronic simulation only. It doesn't yet have a silicon existence. They've been using a Cray supercomputer to run the simulation. And when the Motorola team needed even more computing power, Apple let them use its Cray. The Cray simulations indicate that the Memtran, if it can be built, will do everything the design spec calls for and more. With luck, Motorola might get the Memtran chips into production before the end of 1989.

The latest word from France tells of a HyperCard-like program that far surpasses Hyper-Card in most performance aspects. It has far less graphics ability but still maintains an intuitive, build-it-the-way-you-want-it interface. And it features searching and data manipulation capabilities and speed that shame any database or search engine currently available. This program could be finished as early as mid-summer and could be available on this side of the Atlantic by October. Apple Europe is very interested and, we hear, so are certain folks in Cupertino. One possibility is an Apple buyout and release as HyperCard II, a more powerful

version of HyperCard, which would continue to be improved and sold.

And here's a late flash: We've just received a tip that Apple may have known the identity of the Scores virus author for months. Officially, Apple isn't saying anything, but the U.S. Attorney's office is reportedly dealing with the case. Apparently, the suspect is trying to cop a plea and avoid the civil suits that are sure to come once his name is known.

Have you heard any good rumors recently? Started any yourself that you'd like to take credit for? Can you share your "knowledge" with us? Does your legal department agree? Will you share anyway? If we use your rumor, we'll send you a token of our appreciation and promise not to use your name. Anonymous contributions also accepted. Contact the Rumor Manager by regular, slow, old-fashioned U.S. Mail or fast, modern electronic mail. Our old-fashioned address is Rumor Manager, c/o *MacUser*, 950 Tower Lane, 18th floor, Foster City, CA 94404. Our newfangled electronic addresses are MacUser (on MCI Mail), 72257,2671 (on Compu-Serve), and X0259 (on Apple-Link). No calls please; the Rumor Manager has an unlisted number and much prefers it that way.

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Leader of the Pack

You can't take it with you? That used to be true of data stored on a hard disk. Then along came removable media, and you *could* take it with you, but there was one big problem: Most removable systems made the media portable but kept the read/write heads in the base unit. That meant that there had to be an opening in the cartridge for the heads to enter — as well as dust and dirt. To eliminate this, Mega Drive Systems has produced the Disk Pack, a base unit and removable hard-disk system that keeps the media and heads sealed in an airtight housing.

The Disk Pack consists of a two-slot central unit ($799) that accepts a line of 20-, 40-, or 80-megabyte hard-disk modules (for $899, $1,299, and $1,699, respectively). A 120-megabyte model should also be available by the time you read this. The two-pound modules are fully shock-mounted and ventilated, and they have estimated mean-time-between-failures ratings of 20,000 to 50,000 hours. The Disk Pack is available from Mega Drive Systems, 1801 Avenue of the Stars, Suite 507, Los Angeles, CA 90067; (800) 322-4744.

— *Russell Ito*

MacSpice is the program for the ultimate stereo freak. Using it, you can design your stereo from the circuits on up — and simulate its performance at the same time.

Have disk, will travel. The Disk Pack, from Mega Drive Systems, gives you a removable hard disk that's completely sealed.

The Spice of Life

Electronics hobbyists will appreciate this little goodie from Capilano Computing. MacSpice lets you design analog electronics systems — such as a stereo — by creating schematic diagrams. Using these schematics, you can study the circuitry within your system and simulate how it will work. The system's performance can be checked in another window.

Any distortion in the output — such as sound or electromagnetic waves — can be seen in the performance window and then corrected in the schematic. No elec-

trical tape or crimping tools are needed — just your Mac Plus, SE, or Mac II.

Going further into the electronics simulation scene is Design-Works. This interactive circuit design program lets you design devices at the semiconductor level. This program also works with the Plus, SE, and the II.

DesignWorks sells for $685, MacSpice for $1,500. For more information, contact Capilano Computing, 545 - 108th NE, Suite 6, Bellevue, WA 98004; (604) 669-6343.

— *Kristi Coale*

And Now for Something REALLY Big
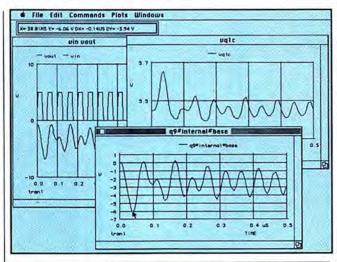
Desktop publishers take note: If your 19-inch monitor is starting to seem cramped (strange but true), E-Machines has the solution — an even bigger picture. Yup, the monitor maker has two 21-inch additions to its Big Picture family.

The monochrome Big Picture Z21 ($2,495) and gray-scale Z21 IQ ($3,495) can display two entire 8½-x-11-inch pages — at actual size — within their 16-x-12-inch viewing areas. The monitors have software-switchable resolutions of 36, 40, 72, and 80 dots per inch, and you can shift between them without restarting the Mac or even redrawing the screen. An ad-

justable virtual screen lets you display larger-than-screen-size images, such as newspaper pages, and instantly pan across them without screen redrawing.

If you buy the Z21 first, you can upgrade to its gray-scale cousin by purchasing a plug-in memory module ($1,095) that displays up to 256 shades of gray. The newest Big Pictures come with video controllers, cables, software, and tilt/swivel stands. By the time you read this, they should be available from E-Machines, 9305 S.W. Gemini Drive, Beaverton, OR 97005; (503) 646-6699.

— *Aileen Abernathy*

Bridging the Gap

Just when you thought you'd heard enough about connectivity products introduced at Macworld, we've come up with a few more. New from Shiva is the Netbridge, a local bridge you can use to expand an AppleTalk network. If

you're at your AppleTalk's network limit, this little device comes in handy — you can split the network locally and connect the two small networks through Netbridge. A serious contender to the Hayes Interbridge, Netbridge sells

If 19-inch displays are too small for you, E-Machines now has a pair of 21-inch models — one monochrome and one gray-scale.

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for $499. Contact Shiva, 155 Second St., Cambridge, MA 02141; (617) 864-8500.

Adding a new twist to an already existing technology is Central Office Local Area Network (CO LAN), available from New England Telephone and AT&T. Working with products such as Shiva's NetSerial peripheral, CO LAN allows for transmission of data at 19,200 bps over ordinary phone lines. Usually, transmission at this speed requires an expensive conditioned line. Currently, this system is being used among the several universities on the East Coast to exchange information between departments at different campuses. You can find out more about CO LAN by contacting AT&T at (201) 580-4621 or New England Telephone at (617) 743-9828.
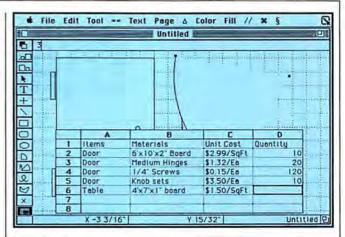
And finally there's the S-Server from Solana, which allows you to dial into and use your AppleTalk network remotely. With this, you can also attach other serial devices, such as modems or plotters, for network-wide access. The server costs $395 and comes bundled with software that enables it to act as a remote gateway. For more information, contact Solana, 7887 Dunbrook Road, Suite A, San Diego, CA 92126; (619) 566-1701.
— *Chip Carman*

A CAD Deal from Diehl

When you're working with a CAD program, the last thing you want to do is worry about keeping track of all the materials and costs as you design buildings. Acknowledging this, Diehl Graphsoft has introduced MiniCAD Plus. From its icon palette, you can select a spreadsheet that has the same features you'd find in some of the well-known stand-alone spreadsheet packages. It comes with predefined formulas, such as those for area, and it also has Boolean features for true/false evaluations.

A heck of a Diehl. With MiniCAD Plus, you can track your material costs — even while you're designing your project.

The entire package is interactive. You can work on a report in a macro and send information from the macro to a spreadsheet. A spreadsheet open within a particular project will keep track of changes and recalculate for area and cost. You can also have spreadsheets on different layers of a project (for example, one to keep track of materials for a door, one to keep track of beams for a room). When finished with your design, you can generate the total cost of the materials in the various layers by selecting the Recount and Recalculate functions.

If you don't have MiniCAD Plus already, you can get it for $695. If you have MiniCAD, you can upgrade to MiniCAD Plus for $150. For more information, contact Diehl Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043; (301) 461-9488.
— *Kristi Coale*

Quick Clicks

ImageWriter LQ

Apple means business, they tell us. That's why the folks from Cupertino created another ImageWriter printer, this one tailored to the presumed needs of businesses on a budget. The printer in question is the ImageWriter LQ. Although the printer has been available for a year, software-driver problems plagued its initial release. Now that the problems have been fixed, the LQ is a viable printer for small businesses.

The LQ got off to a rocky start. One *MacUser* reader speculated that the letters *LQ* stand for *Lotsa Quirks.* From the time it was released in November 1987 until late July 1988, the LQ was shipping with the printer driver version 1.0, which was buggy beyond belief. Apple's release notes for that driver admit: "You may have occasional problems with the spacing between words — words touching or overlapping" when printing in Best Quality. Can you imagine a $1,400 letter-quality printer that can't handle word spacing when printing at letter

The Apple ImageWriter LQ's 216 dpi is close enough to a laser printer's 300 dpi to make it a serious option for small- to medium-sized businesses.

quality? Well, that's what Apple had the audacity to sell for nine months!

The new driver (version 2.0) solves most of the problems. For all its lateness and buggy software, the LQ delivers on at least one point: It does produce letter-quality output. The dots per inch (dpi) output of the LQ can go as high as 216 (when you choose Best Quality). The Macintosh screen is 72 dpi, which is exactly one-third the resolution of the LQ. This three-to-one ratio is deliberate and is how the LQ achieves its better-than-screen output. What it does is look for an installed font that's three times the size of the one you want to print. It then reduces this font (squishes the dots and the space between them) to the desired size.

This method delivers results that rival the quality of laser printers, which chug along at 300 dpi as a rule. But the buyer should be warned that this font strategy practically requires a separate hard disk for efficient use. It also restricts you, for the present, to a precious few fonts. Apple supplies screen fonts for Times, Helvetica, Courier, and Symbol in sizes from 9 to 72 points. To be exact, the fonts come in 9, 10, 12, 14, 18, 24, 27, 30, 36, 42, 54, and 72 points. But don't get too excited about all these sizes; the LQ allows you to print letter-quality type only in 9, 10, 12, 14, 18, and 24 points. What's more, these four fonts are the only ones

available in such oddball screen sizes.

As most Mac users know, large screen fonts mean a large System file. If you were to install all the sizes for just these four fonts, you'd add more than 800K of fonts. Obviously, this severely limits the LQ's high-resolution output if you don't have a hard disk that can accommodate a large System file.

The LQ also prints bit-mapped graphics at 216 dpi, but without adding extra dots to improve the results. Object-oriented graphics sometimes do result in full-blown 216-dpi resolution if the program is LQ-aware (as is FreeHand, for example).

Speed has improved somewhat over the ImageWriter II: The LQ is rated at 90 characters per second (cps) in its Faster Quality mode (which has the same resolution as a II), versus the II's 45 cps. These figures are notoriously slippery, but the overall speed improvement is true.

Other LQ features are much like those of the II. Both models can produce output in seven colors (using an optional ribbon), and both can be shared on AppleTalk networks (with an optional card installed).

Another improvement in the LQ is the printer's almost bewildering number of paper-feed options, not to mention additional cut-sheet feeders and bins that you can buy separately. But attaching these feeders and bins and

The Five-Mouse Rating

🐭🐭🐭🐭🐭	Excellent
🐭🐭🐭🐭	Very Good
🐭🐭🐭	Good
🐭🐭	Fair
🐭	Poor
🐭	Doesn't Work

Quick Clicks are short reviews of released products — not beta release, prerelease, or vaporware. If it appears here, it is available commercially.

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figuring out the connections will give you a headache.

Also on the downside is the noise. When printing certain stretches of graphics, the LQ fairly screeches. I haven't measured the decibels (I was too busy pressing my hands to my ears), but this should give you an idea of the noise level: My cats fell over themselves trying to abandon ship when the LQ printer started its wail. Maybe *LQ* stands for *Least Quiet*.

Apple obviously thought there was a market for this printer, and that may be so. But I can't recommend the LQ until more fonts are available, the price comes down, and it becomes quieter. If you can settle for near–letter-quality type in your business, the ImageWriter II (at 144 dpi) is still a bargain at $600. If you can afford a bit more than what the LQ costs, you might consider one of the QuickDraw laser printers, which boast 300 dpi.

Even with the improved 2.0 software, the LQ still has a lot of quirks. While it does a nice job of printing letter-quality text in the four fonts provided, I can't imagine midsize businesses queueing up to pay a minimum of $1,400 for this big, loud, and limited printer without feeling a bit ripped off.

— *Dave Valiulis*

ImageWriter LQ

🖨🖨½

[LQ]

List Price: $1,400
Manufactured by: Apple Computer, Inc., 20525 Mariani Ave., Cupertino, CA 95014; (408) 996-1010.
Version: Printer Driver 2.0
Requires: 1 megabyte
Compatibility: Mac II and MultiFinder friendly.

Quick Clicks

THINK's LightspeedC

THINK's LightspeedC has been one of the most popular C development environments on the Mac for several years. The system is blazingly fast, and it supports the Mac's user interface well. By using an integrated compiler, linker, and editor, it achieves rapid turnaround time for development and testing of programs. (See "From C to Shining C," April '87, for a review of the original release of LightspeedC.) The single biggest problem with the original LightspeedC was the relative difficulty of using any programming tools outside of the environment. Although this hasn't changed, new features in version 3.0 mean that fewer outside tools are needed.

The most formidable addition to the environment is the source-level debugger. This is a program that enables you to step through your code line by line in C and examine the value of your variables. While this may seem like a fantastic programming tool (it is), it's not without its downside. To use the source debugger, you must be running MultiFinder and have at least 2 megabytes of RAM. It's possible to use the debugger with 1 megabyte of RAM if you cut down the program partitions under MultiFinder and get a Finder substitute, but this is hardly ideal and works only for smaller projects.

Another pleasant change in LightspeedC 3.0 is the documentation, which has been totally redesigned and placed in two volumes. The *User's Manual* contains a series of tutorials on using LightspeedC and the debugger. Volume 2 is a reference manual for the libraries included with the system. My only gripe is that the indexes contain some inaccuracies and omit some key topics.

The C compiler has been upgraded to generate code for the Mac II's 68020 and 68881 processors. Header files can now be precompiled, reducing compilation time considerably. It also

gives more control to the programmer; in this version, you can set more System data than ever before (including MultiFinder information and partition sizes).

This means that there is less need to go outside the environment to set such things as the project's Finder type and creator.

The source-level debugger is the only revolutionary change in LightspeedC 3.0. However, there is one addition to the C compiler that many programmers, myself included, would like to see: the inclusion of object-oriented programming capabilities. The C++ extensions to C would enable users to program in the increasingly popular object-oriented paradigm. This method of programming combines data with functions that act on the data into discrete components known as objects. Object-oriented programming currently is supported by various Mac programming environments such as LISP, Forth, and Object Pascal.

The latter is a language that runs MacApp, Apple's expandable Macintosh application. The objects used are things like windows, menus, and buttons. By using object-oriented programming, you simply create the objects, and they "handle" themselves, greatly simplifying the process of creating Macintosh programs. Object-oriented programming is clearly the wave of the future and the way to program complicated operating systems like the Mac.

The upgrade to LightspeedC is substantial. However, its usefulness to

Mac programmers is somewhat limited by its hardware demands. In the current memory shortage, the 2-megabyte requirement will likely put off many owners of the old versions of LightspeedC, as well as potential new owners. One important point to note is that LightspeedC has not increased in price as a result of the upgrade, so even if you can't use the source-level debugger yet, you can still get an outstanding C programming environment now and have some room to grow when the memory crunch subsides.

The list of commercially successful applications created with Lightspeed C grows daily. All Macintosh developers would do well to consider Lightspeed C as their tool of choice.

— *Jeffrey Sullivan*

THINK's LightspeedC 3.0's source-level debugger in action. The user steps through the program using the buttons at the top of the lower left window. The data window at lower right shows the current value of program variables.

THINK's LightspeedC
★★★½

List Price: $175; upgrade price, $69.
Published by: Symantec Corp., 10201 Torre Ave., Cupertino, CA 95014; (408) 253-9600.
Version: 3.0
Requires: Programming environment requires 1 megabyte RAM; source debugger requires 2 megabytes RAM and MultiFinder.
Compatibility: Mac II and MultiFinder friendly.
Application Size: 238K for compiler; 60K for debugger.
Copy Protection: None

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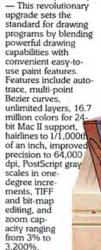
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Quick Clicks

Acknowledge

SuperMac's Acknowledge customizes communications tasks with its sophisticated programming language, TAL. This script picks up mail from an electronic service. The upper half defines the menu items, and the bottom half displays the actual code.

If you're a skilled serial bit banger and programmer who isn't satisfied with ordinary Mac communications programs, you're a good candidate for SuperMac Software's Acknowledge. But if you can't tell Ring Detect from Ready to Send, this developer-oriented package isn't for you.
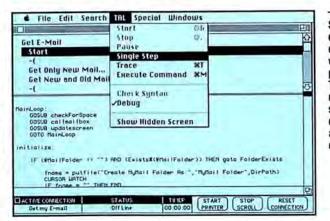
Acknowledge is a combination communications program and interpreted-language system. Using windows, menus, tools, and resources, you build a linked series of communications scripts that can take care of virtually anything likely to pass through the serial port of a Macintosh. The results can be automated self-running modules, semiautomated front ends to simplify complex corporate systems, or completely interactive unique Macintosh-style communications packages. Apple itself, for example, uses an Acknowledge system internally to semi-automatically download and distribute Telexes.

In programming style, Acknowledge is much like a high-end database. The package includes the basic capabilities, such as setting the modem, opening and closing files, and bringing up windows, a menu bar, and a status bar. Doing anything really interesting, however, requires you to write programs in Acknowledge's Telecommunications Access Language (TAL).

TAL resembles an updated and expanded BASIC, with labels, commands, variables, and functions. Naturally, the language is particularly strong in communications control, with commands that send and receive data either by way of higher-level Mac structures or more directly by manipulating the actual hardware serial ports.

There are also commands that look for patterns in the data stream, create dialog boxes for a Mac-style user interface, and set and test communications status and conditions.

If you've done any serious programming, you'll find the communications side of the language quite pleasant. The use of symbol characters such as percent (%) and dollar sign ($) to identify variables makes programs a bit cluttered and hard to read; otherwise, it's straightforward and relatively clean. Acknowledge can even capture in TAL a communications session you run manually as an example.

On the interface side, though, the going is a bit rougher. While some five dialog-box formats are built into Acknowledge and accessible through TAL, you're expected to create any others you need through a modified version of Apple's ResEd resource editor called AckEdit. This is not, as the manual clearly points out, for the careless, the timid, or the inexperienced. Creating a simple dialog box entails creating not only the dialog box resource but also the dialog items, any needed icons, a DESC (description) resource, a DMAP, a DLST, and maybe an ILST and a PLST as well. All these have to be linked to the ICN# (icon number) of the icon for the connection program, and all the various numbers, sizes, and positions must agree.

Amazingly, you also have to resort to AckEdit to change some basic program parameters, such as the size of the communications buffer and the answerback if you're emulating a VT-100 terminal.

Maybe it was once true that for a Mac program to be beautiful, the programmer had to suffer, but it ought not to be any longer. High-end databases once had similarly arcane requirements, but almost all of them now have screen generators, automatic resource managers, and even optimizers.

Even HyperCard scripts have stack-based resource editors. Acknowledge could use a lot of work in this area.

Given the effort it takes to program the user-interface side, it's at least nice that many of your efforts can be reused. Acknowledge uses a linked subroutine structure that allows programs to call independently created subroutines to be used as resources for multiple programs. A common sign-on routine or modem-control file, for example, could be reused both in an electronic-mail front end and as a routine for downloading data from a company mainframe. A single connection file, furthermore, can include several linked or independent connection routines (though it would have been less confusing if one had been named the connection and the other something like the script).

Acknowledge is compatible with all currently sold Macs and the most recent system software as of press time (System 6.0.2). It runs well in both the foreground and background of Multi-Finder, but AckEdit runs only in the regular Finder. Even with moderately complex scripts and search lists, the program appears to keep up with even 9,600-baud modems. Several early developers confirm that it will also run at the faster rates often used for direct machine-to-machine serial links without slowdowns or loss of characters.

The Acknowledge reference documentation is well done. It contains most of what you'll need if you're the type of experienced hacker this package is intended for. Each TAL command is clearly spelled out, along with

a generous supply of examples. A valuable set of appendixes lists not only the Acknowledge error messages but also most of the ones you're likely to get passed back from the Mac operating system. The package comes with several example files, including an automated mail-drop system that sends over a link any file placed in its input folder and basic connections for several of the major dial-up information services. If you need to bootstrap up to the skilled level, though, you may find the user and programmer tutorial manuals somewhat weaker.

If you successfully develop a package in Acknowledge, you can get the run-time versions you need to distribute your work quite reasonably. Bought separately, each run-time version is $10, but if you are accepted as a certified developer, you get your first 250 run-time versions included with training and support in the $500 annual cost.

If you're clever enough, and you don't need any fast processing, you can use HyperCard with the right serial-port, file-control, and encryption XCMDs to do much of what Acknowledge does. If you're looking for a light-duty link for your own use, Micro-Phone II or Red Ryder might be better suited to your needs. But if you need a system that gives the serial port the power to be its best, you'd do well to Acknowledge your more challenging communications requirements.

— *Steve Rosenthal*

Please circle 163 on reader service card.

Quick Clicks

V-series Smartmodem 9600

The Hayes V-series Smartmodem 9600 may be the fastest modem available for the Mac, but you still need software that supports the 9600's format and a special cable before you can take advantage of high-speed transfers.

The Hayes V-series Smartmodem 9600 is a very high-quality, very high-speed modem that is superb for asynchronous communications. When you use the V-series Smartmodem 9600 in an MS-DOS environment, synchronous communications are also possible if you have the additional hardware and software.

The Hayes V-series modems use proprietary error-correcting and adaptive compression methods and, when connected to other V-series Smartmodem 9600s, are capable of transfers over ordinary telephone lines at speeds well in excess of 9,600 baud. The V-series Smartmodem 9600 also supports international communications standards, such as V.32. During our tests ("the modem races"), we achieved throughputs of nearly 14,000 baud on a local connection. The software used during each test was Hayes Smartcom II (version 3.0B).

The V-series Smartmodem 9600 is sensitive both to the cable that attaches it to the Mac and to the software it is running. If you use Smartcom II at both ends of the connection, you can get away with an "ordinary" Hayes-to-Mac modem cable; that is, a cable that has only some of the pins connected. Smartcom II is intelligent enough to see which lines are actually connected, and it reacts appropriately to the conditions it finds. If you try to use that cable without running Smartcom II at both ends, you'll quickly discover that all you have is a very high-quality 2,400-baud modem.

If only one end of the connection is running Smartcom II, you should disable the built-in error-correcting so that you'll be able to do 2,400-baud protocol transfers. If neither end of the connection is running a V-series aware program like Smartcom II, you'll need a new cable, one that has enough pins connected to enable hard-ware handshaking. Unfortunately, such cables are not yet common. Although Hayes does offer the correct cable, few of its dealers actually carry it. You could make one yourself (or have one made for you), but the modem's manual doesn't show the pin connections for the Mac end of the cable. You'll need to rely on your software manual for that information.

Once you have such a cable (and once the machine on the other end of the connection is similarly connected), 9,600-baud (or faster) communications are a snap. They're also exceedingly error-free. Your first high-speed transfer will be a real eye-opener, and the time you'll save by using high-speed regularly can quickly pay for both the modem and the cable.

Actual throughput depends primarily on the quality of the connecting telephone lines. Some areas are blessed with relatively quiet lines, while others are cursed with very noisy ones. The V-series Smartmodem 9600 will run as fast as conditions allow, falling back to lower speeds only as a last resort. As noted, we've been able to reach throughputs of nearly 14,000 baud on local connections. Even more impressive are the regular coast-to-coast speeds of about 8,000 baud. That's on files up to 400K in size.

The software you use with the Smartmodem 9600 will be the most critical element of its operation. Not all software can keep up with this modem. Right now, only Smartcom II (version 3.0B or higher) can take advantage of all the modem's power. Some software, like Microphone II, automatically sends modem-configuration strings that disable some of the Smartmodem's power. Such features can be user-modified, but it's not an easy task, especially for a novice. We've had trouble doing file transfers at any speed using Microphone II.

The modem comes with several manuals, the most important of which is the *Getting Started* guide. The *User's Guide* is too technical and too MS-DOS oriented. A careful reading of its turgid text will teach you a lot about modems and the Hayes command set, but the manual isn't set up for real use.

The Smartmodem 9600 is as good a modem as you can get for a microcomputer. However, its software requirements may take it off everyone's buy list. If you use Smartcom II or can switch to it, this is the modem for 9,600-baud (and faster) communications. If not, well, you just bought the best and most expensive 2,400-baud modem available.

— *Phoebe Murdoe*

V-series Smartmodem 9600
♪♪♪♪½

List Price: $1,299
Manufactured by: Hayes Microcomputer Products, 705 Westech Drive, Norcross, GA 30092; (404) 441-1617.
Requires: Any Mac, Mac-to-modem cable, and communications software.
Compatibility: Mac II and MultiFinder friendly.

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CONNECTIVITY

PC MacTerm/ pcAnywhere III

The PC MacTerm program is a little spooky. There's WordStar 4.0, an application for IBM PCs, sitting comfortably in a window on my Macintosh. On the Mac keyboard, I press Control-C — the WordStar screen scrolls down. I press Control-R — the screen scrolls up, just as it should. I quit WordStar (Control-KX) and find myself staring at the MS-DOS version of a user interface: C>.

PC MacTerm, the source of this aberration, is a remote-access communications program from Dynamic Microprocessor Associates. With PC MacTerm running on your Macintosh and DMA's companion program, pcAnywhere III, running on an IBM PC or compatible clone, you can literally take over the PC from the keyboard of your Mac. You can connect to the PC through a modem, a direct cable link, or, in the future, an AppleTalk network. By setting options in pcAnywhere III on the PC, you can have both keyboards active, allowing both the Mac user and the PC user to work on the PC, or you can have only one of the two keyboards active.

After you're connected, the PC screen appears in the PC MacTerm window on the Macintosh. Once you get over the shock of seeing an MS-DOS window on your Mac, PC MacTerm is almost boring — it just does what it's supposed to do without fuss or bother. The program emulates either a standard IBM monochrome display (MDA) or the text mode of an IBM CGA color display, including IBM special characters. The current version of PC MacTerm (1.1) does not support any IBM graphics modes, but DMA promises future support for IBM CGA graphics.

PC MacTerm maps the PC keyboard to your Macintosh keyboard as closely as possible. On the Apple Extended Keyboard, PC MacTerm maps all the PC keys to the corresponding Mac keys, including F11 and F12. On

Here's a first look at WordStar on the Macintosh. Unfortunately, it's not a Mac version. It's running on an MS-DOS machine that's controlled by a Mac using PC MacTerm. The pull-down menu gives access to the extra keys used on a PC keyboard.

This MS-DOS directory on the desktop can leave Mac users with an eerie feeling of having somehow taken a step backward in "look and feel."

smaller Mac keyboards, PC MacTerm makes the missing keys available through on-screen buttons and pull-down menus.

PC MacTerm enables you to use your Mac printer to print files from the PC and also adds some cut-and-paste features to most PC programs. For example, you can copy a section of a Lotus 1-2-3 spreadsheet and paste it into WordStar. Of course, you can also copy a selection from the PC MacTerm window into a Macintosh application or into the Scrapbook. PC MacTerm has two extra Copy commands: Copy Table, which automatically converts two or more consecutive spaces into a tab, and Copy Picture, which copies the selected part of the screen as a PICT graphic.

PC MacTerm works with Multi-Finder, so you can switch to other programs on your Mac while leaving the Mac-to-PC connection running. The program also handles file transfers between the two computers, including batch transfers in either direction.

The PC MacTerm/pcAnywhere III

connection has three major uses: It enables you to fully control most programs on an MS-DOS computer; you can offer direct "hands-on" support and troubleshooting to PC users in remote locations; and, to a limited degree, it allows you and a PC user to collaborate by working simultaneously with programs and files on the PC. The collaboration is limited because the PC user can't directly access files or programs on the Mac.

Through a direct cable connection running at 57,600 baud, performance is good. You may notice a slight sluggishness rewriting the PC screen in the PC MacTerm window, but it's generally fast enough for any use. Unfortunately, with the direct cable, it's usually impractical to connect more than one PC to your Mac or to connect to a distant PC. This limits the program's usefulness for on-line support, troubleshooting, and collaboration.

With a modem connection, you can connect to any properly equipped PC that's within reach of a telephone. However, the performance at 1,200 or

even 2,400 baud — the average top speed of most office modems — is understandably slow. I found 2,400 baud

Once you get over the shock of seeing an MS-DOS window on your Mac, PC MacTerm is almost boring.

fast enough for on-line help and troubleshooting, and even for short sessions using PC programs, but it would be painfully slow for an extended session.

When PC MacTerm and pcAnywhere III are upgraded to allow communication over an AppleTalk network, most of these performance trade-offs will disappear. AppleTalk offers much better speed and easier connections in a fairly wide local area such as an office building. As is, the PC MacTerm/pcAnywhere III combination is already very useful if you need this kind of remote access to a PC from your Mac.

— *Ted Silveira*

Quick Clicks

FormSet: Business Forms Edition

Most offices use dozens of standard forms daily. The usual procedure to produce them is to keep blank masters around and race for the copy machine whenever the supply runs out. Soft-View, the developers of MacInTax, provides a different approach. Form-Set is a group of electronic forms that replace their traditional paper equivalents.

When you open FormSet, the application lists those forms that you've copied from the master onto your hard disk. (Although the printed system requirements imply that you can get by with two 800K floppies, the program runs much too slowly without a hard disk.) You select the type of form you wish to fill in, and a blank appears on-screen. Fill in the spaces; then print and save the form as you wish.

FormSet's Customization Form provides you with a way to store standard information — such as company name, address, and phone number — that will be used consistently in most of your forms. You can also enter the local tax and auto mileage rates, salesperson's name, and the page titles for multipart invoices and sales orders. The application Logo Paster even adds your company's logo to the forms.

FormSet's linking capability is what puts the Customization Form's information into each individual form. But linking is put to its most sophisticated use in the inventory-management, accounting, and sales-order forms, where FormSet actually deducts from inventory for you. This linking works as long as all the related forms are open.

FormSet also imports information from databases and spreadsheets. You'll probably find the "feel" of FormSet a little strange compared with a spreadsheet or database. Although fields on each form appear to have a limited length, you can actually type past the end of the indicated area.

SoftView provides a "Large Font" option that increases the size of the text on-screen for legibility while preserving a smaller point size for the same field when printing. WYS is not always WYG with FormSet. Check boxes do not have the same appearance as in regular Mac applications, though they work the same way. When you select a field, the area that you fill in, along with its entire label, is highlighted, which is decidedly nonstandard.

Probably the most glaring problem with FormSet is that it allows you to enter data only into prestructured forms. Apart from pasting in a logo, you can't edit the structure of forms, so you must rely on SoftView to design new forms that you might want.

SoftView has announced the release of FormSystem, whick will remedy the situation. But until FormSystem is available, FormSet is of limited use.

SoftView has worked very hard to imitate the feel of the paper forms being replaced with FormSet. A key issue is whether it's more efficient to transfer such standard forms to the computer. If you want an infinite supply of business forms that can be easily edited electronically, you should investigate FormSet. However, if you are looking for forms-design capabilities or for multiuser data-management functions, you should look elsewhere.

— *Louis E. Benjamin, Jr.*

FormSet brings a wealth of standard business forms to the electronic arena. As users enter data, any dependent fields elsewhere on the form are automatically calculated.

It's not surprising that FormSet includes common tax forms, including the W-4 form shown here. The publisher, SoftView, also created MacInTax.

FormSet: Business Forms Edition

List Price: $95
Published by: SoftView, 4820 Adhor Lane, Suite D, Camarillo, CA 93010; (805) 388-2626.
Version: 1.0
Requires: 512KE and two 800K floppy drives or hard disk.
Application Size: 78K
Copy Protection: None

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" This technology will revolutionize the way people look at hard disks."
—Thomas L. Massie
MASS microsystems founder
MACWEEK, Jan. 26, 1988

Quick Clicks

QuickDex

When you change jobs, what's the one item you always bring with you? Your Rolodex, of course. It's your way to keep in contact with your world. In the past, a Rolodex was always a physical creation: paper, metal, plastic. QuickDex offers the same Rolodex convenience and power (and more) electronically. It's a 40K desk accessory, so you can always have it on call. If you use a hard disk (and thus require only one set of data files), this is the only address book you'll ever need.

HyperCard was and is promoted as the ultimate Rolodex, but QuickDex is quicker, better at many operations than the average Rolodex-like stack, and works while you run other applications. Even if you spend most of your time in a HyperCard shell stack — going out to other applications and returning — QuickDex still makes sense. It's just a superior product.

The QuickDex system consists of the QuickDex desk accessory, an extremely versatile printing utility called PrintDex, and the QuickFolder INIT file. The parts complement each other and mesh exceedingly well.

The package's raison d'être is QuickDex, the Rolodex-like name and address filer that turns out to be a remarkably versatile light-duty database. You're not restricted to name and address fields; in fact, there is no formal record structure at all.

QuickDex lives up to its name. It searches on any word and does so at speeds that leave HyperCard (and most other databases) gasping. Searching a thousand cards takes a second or two, and 10,000 cards requires only a few more seconds.

Your databases, or *decks* as QuickDex calls them, can be any size that fits into memory. That's the secret of QuickDex's blazing speed — everything is stored in memory.

As with HyperCard stacks, you can even make phone calls directly from within a deck. The program generates tones through the speaker (just hold your phone handset up to it) or will call

with a modem if one is attached.

QuickDex comes with two sample files to get you going. QuickZIP is a fairly large deck that contains the area and zip codes for more than 1,000 cities. The other deck is called Sample Data. It has phone numbers for computer companies, airlines, hotels, and car rental agencies.

QuickDex data files are basically just text files that follow a particular format. Thus, importing data is usually simple. If the data is already in text file format, you can use any of the macro key programs (MacroMaker, QuicKeys, Tempo II, or AutoMac III) to quickly prepare the data. If your data is in SideKick, QuickFile, Roloacc, or Phone Book DA format, Casady & Greene provides utility programs that do the conversions automatically.

Also included on the disk is Print-Dex, a printing utility that greatly enhances the value of QuickDex. The programmers could have put PrintDex into the QuickDex DA, but that would have made an unwieldy DA. Since the printing functions are rarely used, a separate application makes sense.

PrintDex has preset settings that let it print large and small Rolodex cards, Rediform phone/address book forms, and custom forms that you design. You can sort the cards in several ways, print extra cards based on the keywords in your entries, and print the whole deck or just the most recent entries. PrintDex prints equally well to both LaserWriters and ImageWriters.

QuickFolder (version 2.0) is another wonderful bonus. It's an INIT —

one of those little programs that you stick in your System folder. Quick-Folder loads automatically when the Mac is booted. It provides a New Folder button in the upper-right corner of every Save and Save As dialog box, in every application you run. You click on the button, name your new folder, decide whether to put the saved file into the new folder, and click OK. That's it. Simple, foolproof, and nearly worth the entire price of admission.

QuickDex is an excellent personal database. Even if its restricted format isn't suitable for your data, its incredible speed and ease of use make it worth using for your computer address and phone book.

— *Jake Paden*

QuickDex keeps your personal or business phone book at your fingertips, or at least as close as your Apple menu. The DA search key used is highlighted.

NCE BETWEEN THESE TWO POINTS.

Tables and graphs are easy to add, too. Persuasion automatically generates practically any kind of graph right from the program's data sheet. Or from imported data from spreadsheets such as Microsoft® Excel. And if you want to generate organization charts, Persuasion can do them instantly right from the outliner.

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Quick Clicks

DiskExpress

DiskExpress was the first really effective disk-optimization program. Disk optimizers are intended primarily for use on hard disks, where files are often broken into segments that wind up on different physical parts of the disk. Such "fragmentation," if left to take its natural course, noticeably affects performance. The only cure is to move the files around so that they are no longer broken into chunks.
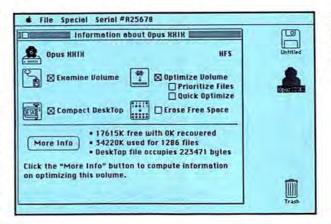
There are two ways to do that. You can back up your hard disk, erase it, and then restore your data, file by file. If you choose this technique, the restore must be file by file. An image backup and restoration will simply restore the original problem.

The second way to optimize a hard disk is to run a special program known as a disk optimizer. While several of these programs are on the market, only one is worth your consideration: DiskExpress.

Early versions of this program had some teething problems, but they were quickly resolved, and by the time version 1.10 appeared several years ago, DiskExpress stood alone in its class. It was very effective, albeit slow. And it suffered a problem necessarily common to all disk optimizers: You should back up your hard disk before you optimize it. That makes the whole operation even more time-intensive.

Most of the current competing programs fail to unfragment large files because they rely on large areas of the disk they're working on to be free. As a result, they can't put the files in optimal order, nor can they do much to repair slightly damaged disks. DiskExpress does all that and more. The newest version, 1.5, also adds a Quick Optimize feature that speeds things up considerably.

If you ask DiskExpress to perform every trick it knows, it's still going to take its time. The hard disks tested for this review contained between 17 and 50 megabytes of material. Depending on how badly fragmented the disks were, optimization took about 20 min-

DiskExpress diagnoses a badly fragmented hard disk before it attempts to close the gaps.

utes plus a bit less than a minute per megabyte. That's quite acceptable.

The program totally eliminated fragmentation, except in its Quick Optimize mode. In fact, Quick Optimize couldn't do much at all with a very full 20-megabyte hard disk. But, to be fair, the manual warns you about this.

One very nice feature is DiskExpress' ability to detect and repair several common types of directory damage. The Prioritize Files option not only unfragments the hard disk but also locates the files on the disk for optimal performance and resistance to future fragmentation. Applications, which have stable sizes, are placed near the beginning of the disk, data files or documents are put on the disk, and the desktop file (which tends to grow constantly) goes at the end, right before the free space.

DiskExpress not only unfragments files, it also unfragments free space, putting together the largest possible blocks. It also provides an option to erase free space by writing zeros to all free space. And, to be very secure, you can have the program go through its erase cycle three times. Once that's done, you can be sure deleted material can't be recovered. If you want to, you can apply this erasing procedure to the whole disk. This should make even the most paranoid and security-conscious users sleep a little easier.

The manual is the latest version of the 1.10 manual, with a three-page addendum covering the new features in version 1.5. One minor omission needs noting: When creating your working

disk, copy the application to it and then add the same version of the System and Finder that are on the disk you plan to optimize. The working disk must be able to boot the Mac, and it won't be able to if it contains an older version of the System than that on the target hard disk.

Don't optimize more than you have to. If your hard disk sees heavy regular use, run the evaluation features of DiskExpress every week to ten days. If the fragmentation index gets near 0.15, your hard disk can stand optimization. If your hard disk gets only sporadic use, check it once a month. If you want to get the most out of your hard disk, DiskExpress belongs in your tool kit.

— *Jake Paden*

"... the clear leader 4th DIMENSION..."

Metaphysics and Praxis

by Louise Kohl

BELINDA MORRISSEY

S t. Paul, Minnesota. American Association for Artificial Intelligence (AAAI) conference. The first thing I notice is that I should have paid better attention in third-grade Geography — what's the Mississippi River doing here, anyway? The second thing I notice is that the artificial intelligence field and I have a lot in common. We both spent far too much time with academics. (And we're both older than we look. But that's another story.)

Artificial intelligence has the air of an oxymoron. We usually designate something artificial in comparing it to something we believe to be "real" — like artificial sweeteners and "real" sugar. We move, in Platonic terms, from the real to the copy. But even six years of graduate school in Philosophy and a thesis on mind/body dualism didn't leave me with a clear idea of what "real" intelligence is. And I very much doubt if the mind/brain dualists over on the "hard" science side have any more of a clue. If we can't describe the real thing, how are we going to recognize the artificial version?

SCI-FI AI

Like a lot of people in the microcomputer world, and the Macintosh world in particular, I've been a science-fiction addict practically since birth. This definitely colors one's view of what artificial intelligence is all about. The reason that sci-fi readers are somewhat over-represented statistically in the computer industry is that we were *ready* for computers when they appeared. More than ready, we were champing at the bit to get this stuff off the page and onto our desks. And we're still waiting and champing. We grew up on computers with personalities, with whom (sic) you could have a conversation, where networking meant being part of an intergalactic knowl-

edge link that makes our current ideas of databases laughably mundane. (If you've read Orson Scott Card's *Ender's Game* or *Speaker for the Dead,* you know what I mean.)

There was none of this at AAAI.

REAL-TIME AI

Artificial intelligence breaks out into two general categories, reflected in the title of this column: theory and practice, or metaphysics and expert systems. Unlike most fields that divide up like this, in AI the two don't necessarily have anything to do with one another. While the academics concentrate on simulating human cognitive processes on computers, the expert systems people are simulating human actions. The theorists are trying to work *towards* rules, the systems people *from* them. AI in general seems to be an area in which there are either too few rules or too many.

With no clear definitions — stipula-

tive or otherwise — of what human intelligence is, it is arrogant to designate other kinds of intelligence as "artificial." Non-carbon-based, maybe, but not artificial. If we come up with a machine that thinks, that intelligence will be real, if almost certainly different. Such a machine will also be self-aware, although the shape and nature of that awareness will also be very different from ours. (I recommend *When Harlie was One* by David Gerrold for a definitive discussion of this point.)

Our AI research can be taken as successful at just that point where we produce something a lot different and smarter than we are. We will have true AI when we have a machine that can (and will) disagree with us. And in this lies much of the fear and trembling with which many people still approach computers. There's always the possibility that such a machine might not only disagree with us — it might not even like us.
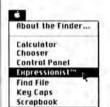
It amazes me that many of the same people who feel this way about machines will produce children with frightening insouciance. There's a strong analogy to be made between raising kids and developing true AI. Both start with only the information we adults give them. Both have (or should have) a built-in "associative engine" that enables them to correlate and categorize information, giving rise to new information. Both have the potential of growing far beyond — and of turning on — their creators. (Arthur C. Clarke's *Childhood's End* is of interest in this context.)

If developing theoretical AI is akin to raising and educating a very bright child, creating expert systems is more like toilet training — or like teaching chimpanzees to use sign language. It may be useful, but it's comparatively uninteresting. And while there are more expert systems in place than
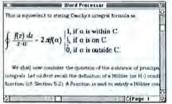
■ CONTROL PANEL

there are self-conscious machines, a look around the AAAI show and a glance through the current literature indicate that neither side can claim success.

(There's certainly a case to be made for viewing the computer modeling of human intelligence as just another expert system. Unfortunately, it's a system in which there are no true experts.)

BACK TO THE FLOOR, CHET

However, there were some faint glimmers of hope for the future at AAAI. For one thing, Apple had a booth there for the first time. And if any computer can break through the barrier of distrust, it will be something like the Macintosh, with its easy accessibility and (sorry, Mr. Sculley) its air of sheer fun. Your Mac may infuriate, but it doesn't intimidate. The concept alone of AI is daunting enough without having to pursue it via a recalcitrant and cranky computer.

The Apple booth wasn't the only place with Macs in evidence. They were all over the place. (Well, not in the Hewlett-Packard booth, maybe, but you get the idea.) Apple was trumpeting the message that, whatever you wanted to do in artificial intelligence or any other area, they had the platform for it. And if they didn't have it yet, they *would,* as soon as they knew what was needed. I hate to say it, but Apple may well be on the right track.

The Mac, with its unprejudiced access to just about every other computer from PC to neural net, is an excellent front-end machine for AI work. The Knowledge Systems Labs at Stanford University has already put a number of Mac/MicroExplorer combinations to work this way. The Mac's much-touted short learning curve means users can devote their time to AI development rather than to learning the quirks of various operating systems.

The Mac has made a more immediate mark in AI development, too. Prolog, a programming language for artificial intelligence, is gaining greater acceptance due to Macintosh implementations. LISP will probably remain the AI programming language of choice; there are several excellent im-

Apple may be on the right track.

plementations of that language, too, for the Mac. (See "Artificial Intelligence from A to I" in the December '88 issue for more details.)

Let's give computers the really difficult problems to solve. An idiot savant can crunch numbers. The worst that can happen is that it comes up with "42." And on the positive side, maybe the Knowledge Navigator, or something like it, will actually appear.

APPLE COMES OF AGE

The Knowledge Navigator is Apple's mythical ultimate personal computer, featured in many a visionary promo video often accompanying Messrs. Sculley, Gassée, et al at trade shows and conferences. About the size of a Toshiba 1000, it opens like a book and can do everything from reminding you of appointments — verbally — to linking you into worldwide databases. (It seems to be particularly au courant about anything to do with the Amazon Rain Forest.) It's something like the Hitchhiker's Guide crossed with a good secretary.

Apple showed all four Knowledge Navigator videos in its booth at AAAI. Within an hour of the first showing, people had rearranged all the chairs in rows and were all but salivating at the screen. You could hardly ever find an empty chair. They were also button-holing any Apple rep they could find anywhere. (I conducted an interview with Harald Striepe from Apple in a stairwell.) Everyone wanted to know where they could buy "that machine."

It's a long way from a "toy computer" to the easy assumption that you can produce the Knowledge Navigator out of a hat. This, more than anything else, tells me that Apple and the Macintosh have arrived — in the minds of consumers, at any rate. We're that much closer to turning sci-fi's "artificial" visions into reality. ▨

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Turbo Trackball ADB (SE & Mac II) ....85.
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Adobe Illustrator: Handbook ....19.
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Macstation II - Platinum ....75.
Datadesk
Hyper Dialer ....29.
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Ergotron
Mactilt SE ....72.
Mouse Cleaner 360° ....12.
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Imagewriter Ribbons -Black ....4.
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Cabinet (Holds 45 Disks) ...19.
Cabinet (Holds 90 Disks) ....29.
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System Saver Mac Fan ....68.
Turbo Mouse ....119.
Kraft
Quickstick (ADB Joystick) ....47.
Quickstick (Mac Plus Joystick) ...38.
Mac Packs - Gray,Navy & Wine
Imagewriter Bag ....49.
Mac Plus/SE Bag ....68.
Mac SE (Extended Keyboard) Navy ....74.
MacZone
Noise & Surge Protector ....24.
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Mobius
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MscTechnologies
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Grappler Mac LQ ....91.
Grappler Mac ....78.
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Double Sided Disks-Bulk......ea. 1.75
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Cricket Graph ....118.
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Deneba Software
Coach Professional ....109.
Coach Thesaurus ....36.
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Thunder ....32.
Freesoft
Red Ryder 10.3 ....54.
Individual Software
101 Scripts & Buttons (For Hypercard) ..45.
Lundeen & Associates
Works Plus Command ....62.
Works Plus Spell 1.1 ....47.
Mecca
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Focal Point/Business Class ....49.
Reports ....89.
Micro Lytics
Gofer ....44.
Word Finder ....34.
Micromaps
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Microsoft
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File ....139.
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Works 1.1 ....198.
Write ....125.
Monogram
Business Sense ....262.
Dollars & Sense 4.0 ....80.
Nolo Press
Will Maker ....35.
Odesta
Double Helix Release 2 ....337.
Peripherals Computers & Supplies
Kaleidagraph V1.1 ....124.
Versa Term Pro 2.20 ....198.
Versa Term V 3.20 ....68.
Personal Bibliographic
Pro-Cite ....295.
Select Micro Systems
Map Maker 3.X ....221.
Softview
Tax View Planner ....48.
Software Discoveries
Record Holder Plus ....44.
Software Ventures
Microphone 1.1 ....109.
Microphone II ....221.
Survivor Software
Mac Money V. 3.0 ....64.
Symantec
MacSQZ! ....49.
Symmetry
Hyper DA ....38.
T/Maker
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Wordperfect ....189.

Working Software
Lookup 1.0c ....30.
Spellswell Ver. 2.X ....45.
Spellswell Legal Dictionary ....57.
Spellswell Medical Dictionary ....57.

Graphics

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Aba Software
Draw It Again Sam! ....88.
Graphistpaint II ....375.
Altsys
Fontastic Plus ....75.
Fontographer ....239.
Cricket Software
Cricket Draw ....168.
Cricket Presents... ....285.
Pict-O-Graph ....104.
Deneba Software
Canvas 2.0 ....168.
Dream Maker Software
Mac Gallery (Hypercard Format) ..28.
Mac Gallery (Paint Format) ....28.
Dubl-Click Software
Wetpaint – Vol 1 & 2 "Classic Clip Art"
Vol 3 & 4 "For Publishing"
Vol 5 & 6 "Animal Kingdom"
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Symmetry
Picture Base 1.2 & Pb Retriever ..62.

T/Maker
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Zedcor Inc
Deskpaint V.2.0 ....65.

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Bible Research Systems
The Word (KJV & NIV) ....179.
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Eureka: The Solver ....128.
Bright Star Technology
Alphabet Blocks (Requires 1 Meg) ...30.
Electronic Arts
Venture's Business Simulator ......48.
Great Wave Software
Kids Time ....26.
Mindscape
S.A.T./Perfect Score ....47.
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Reader Rabbit ....36.
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• Algebra   • Arithmetic
• Calculus   • Discrete Mathematics
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Games

Access Software
World Class Leader Board ....30.
Accolade
Hardball ....27.
Broderbund
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Ancient Art Of War At Sea ....30.
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Ferrari Grand Prix ....32.
P-51 Mustang Flight Simulator ....31.
Discovery Software
Arkanoid ....30.
Electronic Arts
Chessmaster 2000 ....28.
Chuck Yeager's Flight Trainer ......32.
Patton Vs Rommel ....14.
Scrabble ....25.
Epyx
Sub Battle ....24.
Greene Inc
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Henderson & Associates
Real Poker ....25.
Infinity
Go & Grand Slam Tennis .....each 27.
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Quarterstaff ....35.

The Pricing Game

by Jim Seymour

Let's talk money. Yours and mine. Apple has a long history of eccentric and unfortunate pricing. And the Macintosh, since its rollout nearly five years ago, has been the victim of that pricing. (I'm tempted to say "that pricing policy," but except for Steve Jobs' early "whatever the market will bear" approach, I cannot divine anything resembling a coherent policy or business strategy in Apple's pricing, so I am loathe to dignify the company's dart-board approach with the term "policy.") The most recent examples of this self-defeating pricing nonpolicy appeared in the middle of September, when Apple cranked up prices wildly on the Mac II, then socked it to us again a couple of weeks later with outlandish pricing on the curious Mac IIx.

We should get two widely accepted assumptions on the table: (1) Macs have always been costly, many would say too costly; and (2) Apple would have been well served by repricing the Mac Plus in the under-$1,000 range when the SE and Mac II appeared. I agree with both of those views. As much as I love them, Macs have been and generally remain overpriced. And Apple's own self interests, as well as those of the third-party software developers who have played such a large role in the Mac's success, as well as those of a million or so prospective customers, would have been far better served by positioning the Mac Plus as a low-priced, entry-level machine. This would have made it competitive with IBM PC and PC/XT clones, rather than letting it limp along in the curious limbo it has occupied since the SE rollout.

My assertion is that the upward repricing of the Mac II and SE lines — and especially of "bare" Mac IIs, without Apple-installed hard disks — came at precisely the wrong moment.

And worse, it was explained away by Apple representatives spouting the most specious reasoning. These, you may remember, were not modest price increases. For example, the one-floppy/1-megabyte Mac II went up more than 29 percent, from $3,769 to $4,869. The same machine with Apple's internal 40-megabyte hard disk went from $5,369 to $6,169, about 15 percent. And that machine with four megabytes of memory went up 11 percent, from $7,269 to $8,069. The Mac SE didn't escape; the one-floppy SE went up 14 percent, from $2,769 to $3,169; SE's with Apple-installed 20-megabyte hard disks went up about 6 percent, from $3,569 to $3,769. Ummm ... isn't this the business where prices on maturing technology are supposed to go *down*? More than a year and a half after its introduction, shouldn't we see prices falling rather than rising on the Macintosh II?

When I said these price hikes came at exactly the wrong moment, I wasn't talking about only, nor even principally, the moral justice of the thing, but about Apple's treatment of its dealers and customers with this action. This is the moment Apple should be encouraging, not sabotaging, those corporate people whose long and sometimes embarrassing-to-risky advocacy of the Mac has begun to pay off. The comparison for corporate people is between the cost of an SE and a PC/AT clone (or an IBM PS/2 Model 50 or 60), and a Mac II versus an 80386 MS-DOS machine — cost comparisons already unfavorable to the Mac by 50 to 75 percent. What did Apple hope to accomplish by making those comparisons even more unfavorable and the positions of those arguing for corporate adoption of Macs instead of DOS machines so untenable? And for dealers who had literally thousands of deals cooking at the old prices when Apple announced the jump — deals that were already on the edge of plausibility because of the existing premium for Macintoshes — the price hikes were infuriating.

I want to be clear that this isn't a populist plea for low prices and corporate benevolence. I admire the gross margins John Sculley has been rolling up at Apple, and I understand very well the need for large margins in a company as committed to huge R&D investments as is Apple. What I don't like is to see Apple hurt itself in the eyes of so many of its strongest boosters — corporate micromanagers, high-visibility power users, and savvy dealers and their best salespeople — people who are so important to Apple's continuing success. In the end, this argument isn't about fairness and decency, but about the cold realities of serving a

corporation's long-term self-interest.

Well, maybe it *is* about fairness and decency a little, too, because I also don't like being lied to. Apple laid these price increases off on their supposed huge increases in DRAM memory costs, as existing contracts with

their suppliers ran out. In other words, Toshiba went up to market prices when Apple's long-standing sweetheart deal ran its course. As was widely (and accurately) reported at the time of the Apple price increases, that story just doesn't wash. No matter how

good Apple's old deal for memory chips and SIMMs was, the reality is that today's "soaring" memory prices have actually been falling since late May '88. And the downward trend has been steady. Industry analysts at Dataquest, for example, report that 1-megabyte DRAM prices, in wholesale quantities, peaked at around $27 in the middle of May. By the time Apple was writing the press releases explaining away the Mac II and Mac SE price increases, those 1-megabyte DRAM prices had fallen to about $20.

Moreover, the pattern of Apple's price increases doesn't jibe with this explanation. If it really was the cost of memory that drove up prices, how come the 1-megabyte, no–hard-disk Mac II went up $1,100, while exactly the same machine with a hard disk installed went up only $800? And if that 1-megabyte hard-disk–equipped Mac II went up $800, how come the identical machine with *four* megabytes of memory installed went up . . . $800? Apple can say there are many reasons for these "apparent discontinuities," and for such inconsistencies appearing now. Apple might have done a lousy job of pricing Mac IIs and SEs at their introduction, for example. Apple could be folding in economies from falling prices for hard drives. Apple could have achieved production economies in other areas. But as you chase down those explanations, you find they, too, defeat Apple's thesis. The fact is, at almost the worst possible moment, Apple yanked up prices on Mac IIs and SEs because they could get away with it. The much-rumored $200-million backlog of orders Apple has enjoyed over the past few months was probably a prime force here: "If we're doing so well, isn't it time to manage that demand, and improve our quarterly results, with some price manipulation?" Wrong, wrong, wrong.

Fred Davis, my friend and colleague who edits *MacUser,* likes to explain Apple's inevitable high prices by pointing out that Macs offer premium technology, for which we should be willing to pay premium prices. I *am* willing, Fred. As are a lot of us. But there are limits. And I think Apple just ran into them. ▨

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Interpreting Dreams

by Robert R. Wiggins

DAVE JOLY

odney Dangerfield and Apple have something in common — both of them get no respect. Last month the topic was Apple's many faces and the resulting image problems. But the "no respect" is the result of another Apple image problem.

It all started at the very beginning, when the two Steves — Jobs and Wozniak — teamed up to produce a computer. Woz was a hacker in the best sense of the word, an altruist who wanted to share with everyone the fruits of his knowledge. Jobs was more business-oriented, but he also shared a vision with Woz of changing the world by making computers for the common man. To many people it was a wonderful vision, and part of the phenomenal success of the Apple II was the feeling people got that they were buying more than a computer; they were buying into a dream. It was the best part of the '60s counterculture brought forward into the '70s. Apple and its customers were partners in a revolution.

As the '80s began, Apple had to grow up and become a company. It was still not a conventional company, but it became more conventional than Woz liked. Then IBM unleashed its bulldozer on the path that Apple had trailblazed, and Apple's world began to turn upside down. Personal computers became tools for business. Apple tried and failed to build business computers to compete with IBM, first with the Apple III and then with the Lisa. Meanwhile, Steve Jobs still had his vision of computers for the masses.

To realize that vision, Jobs assembled a team of the best and the brightest engineers and programmers. The now-famous pirate flag that flew over the building where the Macintosh team labored into the wee hours of each day symbolized the return of the counterculture to Apple. The end re-

sult was Macintosh, the computer for "the rest of us," the appliance computer, the computer for the common man. It was a magnificent achievement, and Steve Jobs will always be remembered for his vision.

It's a wonderful story. So wonderful that dozens of books have been written about it, and there are even rumors of a movie (one rumor has Tom Cruise playing Jobs). But it's also at the roots of one of Apple's biggest problems: no respect. Because the Apple of today is nothing like the Apple of ten or even five years ago. Jobs is gone and is pursuing his dream elsewhere. Apple today is a Fortune 100 company, with sales in the billions of dollars. The Apple of today has more in common with archenemy IBM than it does with the original Apple.

The reason Apple gets no respect is because so many of its customers still think of it as the altruistic company run by the two Steves. People who buy

IBM PCs are buying tools, but many people who buy Macintoshes are buying a dream that no longer exists.

When Apple realized the original 128K Macintosh was too limited because of memory constraints, they quickly introduced the Mac 512K. They also made an upgrade available to the existing users. What was the reaction of the dreamers? They howled as if they'd been stabbed in the back. Many argued that Apple *owed* them the upgrade for *free*, because they had been true to the dream and bought the original Mac on faith.

When Apple introduced the Mac Plus and again offered upgrades for existing users, the howls became screams. Apple had betrayed the dreamers by making a better computer that was cheaper than what they had paid for their Mac 128Ks and 512Ks. Again they demanded free upgrades and wailed of Apple's ingratitude.

Every time Apple introduced an improvement, the dreamers wanted it for nothing, as a reward for their loyalty. Every time Apple reduced prices, the dreamers wanted a rebate. Nothing Apple could do was good enough for the dreamers. When the Lisa was discontinued, Apple offered a trade-in program to allow owners to get a Macintosh. Hoots, catcalls, and sneers were Apple's rewards. And when the Mac SE and Mac II were introduced and had no upgrade path, the howls and screams redoubled.

But the best was yet to come. When memory shortages and supply problems led Apple to raise prices in September 1988, the screams were the loudest ever. The same people who moaned and wailed with each price reduction were now howling indignantly at a price increase.

No respect.

It's a shame, too, because Apple deserves a lot of respect. Apple survived

Programs & Peripherals

Printers & Digitizers

AST Research TurboLaser P/S	Call	
TurboScan Flatbed model	1329.	
Caere Omnipage	569.	
Koala Technologies Corp.		
MacVision 2.0 *(Digitizer)*	225.	
Kurta IS ADB Tablet	259.	
Cordless 4 Button Cursor	99.	

Seikosha SP1000 *(Imagewriter Comp.)*	235.
Summagraphics Bit Pad Plus	335.
ThunderWare	
ThunderScan V4.0 with Power Port	199.
Mac II Power Accessory	42.
Video Technology	
Laser 190 A (Imagewriter Compatible)	239.

Modems

Abaton InterFax 12/48	Call	
Anchor Automation		
MacPac 2400E w/software & cable	179.	
Epic		
Epic 2400 Int. SE	315.	
Epic 2400 Int. Mac II	315.	
Epic 2400 Mini Ext.		
(Hayes Compatible)	155.	
Everex Emac 2400 Baud	225.	
Hayes Microcomputing		
Smartmodem 1200	299.	
Smartmodem 2400	449.	
MDIdeas Commlink 2400	189.	
Migent		
Migent Pocket Modem		
(ext. 300/1200 Baud)	115.	
Novation Novation Parrot 1200	109.	

Practical Peripherals		
Practical Modem Mini 1200SA	85.
Practical Modem 1200SA	109.
Practical Modem 2400SA	189.
MacCommpack	
(2400SA w/Microphone & Cable)	249.
Prometheus	
Promodem 2400M Ext.	
(Software & Cable)	199.
Promodem 2400	
(Hayes Compatible)	309.
Supra Corporation Supra Modem 2400	149.
U.S. Robotics	
Courier 1200 *(Hayes Compatible)*	199.
Courier 2400 *(Hayes Compatible)*	349.
Courier 2400E *(Hayes Compatible)*	379.
Courier HST 9600 *(Hayes Compatible)*	689.

Microphone II by Software Ventures

Microphone II is the communications package for the Mac that lets you do what you need to. Whether you're a novice logging on to CompuServe or a professional who demands flexibility and power, you're on the way to headache-free communications. *Microphone II* is fully compatible with all Hayes and non-Hayes modems, offers transfer rates of up to 57,600 baud, and supports XMODEM/ YMODEM, Kermit, MacTerminal, and ASCII transfer protocols. *Microphone II* offers powerful scripting features which let you pre-program often used routines and procedures. It's Multi-Finder and Mac II friendly, and offers background file transfer to save your valuable time.

Microphone II .... **225.**

Accounting Packages

Aatrix Software Aatrix Payroll V3.0	99.	
Aatrix TimeMinder	109.	
Aatrix Payroll Plus	159.	
Bedford Software		
Simply Accounting	219.	
Chang Labs		
New Enhanced Version III Modules!		
Rags to Riches 3-Pak 3.1 *(GL/AR/AP)*	289.	
Rags to Riches GL, AR, or AP	120.	
Dac Software Dac-Easy Light	45.	
Intuit Quicken	*Special* 35.	

Layered Insight One Write	185.
Insight Expert GL, AR, or AP	479.
MECA Managing Your Money	129.
Migent In House Accountant	119.
Monogram Business Sense	279.
Dollars & Sense 4.0	81.
North Edge Software Timeslips III	119.
Peachtree Back To Basics Professional	
(GL/AR/AP/INV)	159.
Survivor Software	
MacMoney 3.0 *(Enhanced Version)*	62.

Networking Software & Hardware

CE Software Quick Mail	169.	
Infosphere		
MacServe *(Network Software)*	158.	
LaCie Silverserver	93.	
Microsoft Microsoft Mail 1-4 users	195.	
Nuvotech		
TurboNet 128/512k or TurboNet Plus	27.	
Olduvai Software Clip Share	109.	
Font Sharer	149.	
Shiva NetModem V1200	359.	
NetModem V2400	479.	

Net Serial X232	309.
NetBridge	309.
SuperMac Software Acknowledge	349.
Multi-User SuperLaserSpool	199.
Symantec InBox-MacConnection	75.
InBox-Starter Kit V2.0	
(3 Personal Connections)	199.
TOPS Tops 2.0 or Net Print	119.
Tops Repeater	129.
Tops FlashCard	169.
Tops Teleconnector Din8 or DB9	39.

Cutting Edge 800K External Drive by Cutting Edge

The *Cutting Edge 800K External Disk Drive* is the solution for Mac owners who are tired of swapping disks when using large programs or files. This external drive does everything that Apple's does, at a much more reasonable price. It's fully compatible with the Mac 512KE, MacPlus, SE, and II. Use of the drive is exactly the same as for the internal drive you already own, so there are no new keyboard commands or other tricks to learn. Increase your computing efficiency economically with the *Cutting Edge 800K External Disk Drive* today!

Cutting Edge 800K External Disk Drive .... **175.**

Communications Software

Compuserve Compuserve Starter Kit	24.	
Grolier On Line Encyclopedia	32.	
Compuserve Navigator	45.	
DataViz MacLink Plus with Cable	145.	
Dow Jones Desktop Express	95.	
Freesoft Red Ryder V10.3	55.	
Hayes Smartcom II 3.0	88.	

Insigna SoftPC	479.
Peripherals Computers & Supplies	
VersaTerm	69.
VersaTerm-Pro	199.
Software Ventures	
Microphone II *(Includes Glue)*	*Special* 225.
Traveling Software LAP-LINK	85.

Utility Software

ALSoft Disk Express	35.	
Font/DA Juggler Plus	42.	
Berkeley System Design Stepping Out II	52.	
Beyond Inc. Fore Runner	32.	
CE Software		
QuicKeys *(Macro Program)*	54.	
Central Point Software		
Copy II Mac *(Includes MacTools)*	20.	
PC Tools Deluxe Mac	49.	
Emerald City Software LaserTalk	187.	
Fifth Generation Systems Suitcase 2.0	44.	
FastBack For The Macintosh	54.	
Power Station	37.	
Infosphere Liaison	129.	
Microlytics, Inc. GOfer	45.	
Microseeds Redux	65.	

Olduvai Software Icon-It! or MultiClip	39.
Read-It! TS *(For Thunderscan)*	79.
Read-It! O.C.R. 2.0	
(For Image Scanners)	199.
PCPC HFS Back-Up	28.
SuperMac Software SuperSpool 5.0	54.
SuperLaserSpool 2.0	82.
Diskfit 1.4	*Special* 54.
Sentinel 2.0	155.
Symantec MacSQZ!	49.
Symantec Utilities for Mac *(S.U.M.)*	59.
Williams & Macias	
myDiskLabeler w/Color	31.
myDiskLabeler w/LaserWriter Option	34.
Working Software	
Findswell 2.0 *(Document Finder)*	36.

MacBottom SCSI Hard Disk Drives by PCPC

MacBottom SCSI Drives arrive completely formatted with easy-to-use software including a print spooler, a floppy disk duplicator and a backup program. *MacBottoms* come with everything you need to get started including cables, terminators, and an additional SCSI port. You can even get a Hayes compatible 1200 baud modem built right in. *MacBottoms* weigh less than five pounds and measure just two inches tall but no other hard disk stacks up!

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MacBottom 45 MB Hard Drive .... **859.**
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Game Software

Access World Class Leader Board Golf	34.	**Beyond Zork,** Zork Trilogy or QuaterStaff	30.	
Accolade Hard Ball	23.	Zork Zero	42.	
4th & Inches	24.	**Microsoft** Flight Simulator 1.02	32.	
Activision Shanghai or Jinxter	24.	**Micro Sports** MSFL Pro Draft	26.	
Corruption	30.	MSFL Pro League Football		
Universal Military Simulator or Manhole	32.	or 500 Great Teams	32.	
Might and Magic	37.	**Miles Computing Inc.** Down Hill Racer	24.	
Sky Travel	45.	Harrier Strike Mission II		
Artworx Bridge 5.0	22.	or The Fool's Errand	27.	
Avalon Hill Mac Pro Football	30.	**Mindscape** Balance of Power 1990,		
Broderbund Ancient Art of War	27.	Crossword Magic or Citadel	30.	
ShufflePuck Cafe or Ultima III	24.	Deja Vu: A Nightmare Comes True	30.	
Poster Maker Plus	36.	King Of Chicago or Shadowgate	30.	
Bullseye Software		Defender of the Crown, Colony		
P51 Mustang or Ferrari Grand Prix	32.	or The Uninvited	30.	
Cassady & Greene, Inc. Crystal Quest	27.	**Practical Computer Applications**		
Crystal Quest w/Critter Editor	42.	MacGolf or Lunar Rescue	35.	
Centron Crapsmaster,		MacCourses	32.	
Roulettemaster or BlackJack Ace	27.	Road Racer	45.	
Discovery Software Arknoid	30.	Mac Golf Classics	59.	
Electronic Arts Ogre	20.	**Primera** Smash Hit Racquetball II	21.	
ChessMaster 2000	28.	**Sierra On-Line** Leisure Suit Larry	23.	
Chuck Yeager Flight Simulator		Space Quest or Space Quest II	29.	
or Life & Death	32.	Police Quest	29.	
Starfleet I	37.	**Silicon Beach Software**		
Scrabble	26.	Dark Castle or Apache Strike	27.	
One-On-One, Pinball Construction Set,		Beyond Dark Castle	27.	
Seven Cities of Gold, SkyFox, or		**Sir-Tech** Mac Wizardry	35.	
Patton vs Rommel	15.	**SoftStream, Inc.** Colour Billiards	39.	
EPYX Sub Battle Simulator	30.	Mac Man or Solitaire DA	24.	
Hayden Software Sargon IV	29.	**Sphere, Inc.** Tetris	23.	
H.J.C. Software, Inc.		GATO, Orbiter or Pt-109	26.	
Air Traffic Control Simulator	29.	Solitaire Royale *(Mac or MacII)*	20.	
Infinity Software, LTD.		Falcon 2.0	32.	
Go or GrandSlam Tennis	27.	**Studio Zero** Orbital Mech	29.	
Infocom Leather Goddesses of Phobos		**XOR Software** NFL Challenge	64.	
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MAC-101 Keyboard by DataDesk

If you are looking to replace your Mac's keyboard, the *MAC-101* by DataDesk is the way to go. It comes in an ADB version for the Mac SE and II, and a non-ADB version for the Mac 512 and MacPlus. The positive tactile, firm feel 101 includes a full numeric keypad, 15 function keys, 6 page control keys, and a T-style cursor pad. Keyboard status indicator lights let you know when everything is going smoothly. Includes *101-Keys* desk accessory software, a powerful macro utility which allows you to exploit the full power of the function keys with almost any Macintosh application.

MAC-101 Keyboard *(Specify ADB or non-ADB)*.................**139.**
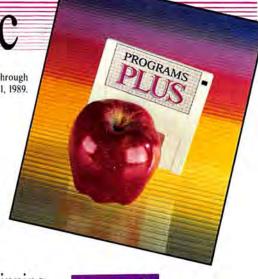
Blank Media

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Sony 3½" SS/DD Disks *(box of 10)*	13.	Maxell 3½" DS/DD Disks *(box of 10)*	20.
Double Sided 3½" Diskettes		Verbatim 3½" DS/DD Disks *(box of 10)*	19.
Bulk *(Sony)* 3½" DS/DD *(10)*	17.	3M 3½" DS/DD Disks *(box of 10)*	20.
Centech 3½" DS/DD Color Disks *(10)*	19.		

Languages

Borland Turbo Pascal	65.	**Microsoft** Microsoft Quick Basic	74.
Turbo Pascal Tutor	46.	**Smethers & Barnes** Prototyper	72.
Consulair Mac 68000 Dev. System	59.	**Symantec** Lightspeed C	95.
Mainstay V.I.P. 2.5		Lightspeed Pascal	65.
(Visual Interactive Programming)	109.	**T.M.L.** TML Pascal II *(Includes MPW)*	79.
Manx Aztec C	75.	TML Source Code Library II	42.
Aztec MPW C or SDB	115.	**Zedcore** ZBasic 5.0	119.

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Educational/Creative Software

Ars Nova Practica Musica	79.	Venture's Business Simulator	47.	
Barron's Barron's SAT	35.	Deluxe Music Construction Set V2.0	61.	
Bible Research		1st Byte/Electronic Arts		
The Word (KJV or NIV)	165.	Kid Talk, Speller Bee,		
Bogas Productions		First Shapes, or Math Talk	32.	
Studio Session	49.	Great Wave Software		
String Quartet, Country or Heavy Metal	15.	KidsTime	26.	
Super Studio Session	79.	Number Maze	30.	
Bright Star Technology		Crystal Paint	41.	
Alphabet Blocks	32.	Individual		
Talking Tiles	75.	Typing Instructor Encore	26.	
Broderbund Clip Sounds	36.	Learning Company		
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Type!	20.	w/ The Perfect College	46.	
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Coda Mac Drums	35.	MacKids Educational Programs (each)	28.	
Perceive	65.	Simon & Schuster		
Davidson & Associates Speed Reader II	39.	Typing Tutor IV	35.	
Math Blaster or Word Attack!	27.	Springboard Top Honors	64.	
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Quicken by Intuit

Quicken is the fast, easy way to cut through personal and small business paper work. In minutes you'll get a handle on your finances without having to bother with all the burdensome terminology and repetitive entry that most accounting packages require. *Quicken* is flexible; it lets you enter an unlimited number of transactions, expense and income categories, and checking accounts. *Quicken* lets you write checks, make and track budgets, manage cash flow, and even reconcile unbalanced accounts. *Quicken* is ideal for people who need to manage any sum of money in a small amount of time!

Quicken .... **35.**

Graphics Software

3G Graphics Images with Impact!	59.	Laserware Laserpaint Color II	359.	
ABA Software Draw It Again Sam 2.0	79.	Letraset ImageStudio 1.5	279.	
Graphist Paint II	289.	Macromind Videoworks II	175.	
Adobe Systems Adobe Illustrator 88	319.	Videoworks II Accelerator	118.	
Adobe Fonts (Various volumes)	Call	Videoworks II Driver for Hypercard	61.	
Aldus Freehand	349.	Micro Illusions Photon Paint	179.	
Altsys Corp. FONTastic Plus 2.0	54.	Micro CAD/CAM MGMStation	685.	
Fontographer 2.2	239.	Micro: Maps		
Ashton Tate Full Paint	69.	MacAtlas Paint 2.0 (MacPaint Format)	45.	
Broderbund Print Shop or Clip Sounds	36.	MacAtlas Hyper Atlas	64.	
Drawing Tables	79.	MacAtlas Professional		
CE Software Calendar Maker 3.0	27.	(PICT/MacDraw Version)	129.	
Claris MacPaint 2.0	105.	Microsoft Microsoft PowerPoint 2.0	249.	
MacDraw II 2.0	309.	Olduvai Software		
Cricket Software Cricket Draw	169.	Post-ART II (4-Disk Set)	59.	
Pictograph	105.	ArtFonts 1, 2 or 3	Special 59.	
Cricket Graph or Paint	119.	Silicon Beach Software		
Cricket Presents	289.	SuperPaint 2.0	109.	
Deneba Software Canvas DA 2.0	75.	Digital Darkroom	159.	
Canvas 2.0 (Includes Desk Accessory)	169.	Super 3D	159.	
Dream Maker MacGallery		Solutions International		
(Hypercard or Paint)	29.	The Curator (Catalog Your Art)	79.	
Cliptures	97.	Springboard Certificate Maker	24.	
Dubl-Click Software		Works of Art Assortment,		
World Class Fonts: Various Vol. 1-6 (ea)	45.	Holiday, or Education	32.	
WetPaint: Various Vol. 1-16 (ea)	45.	Works of Art Laser Art or Fonts	64.	
Electronic Arts Studio 8 (MacII)	319.	Springboard Publisher	119.	
Enzan-Hoshigumi USA		SuperMac Software Pixel Paint	209.	
MacCalligraphy 2.0	109.	Symmetry		
Japanese Clip Art	Call	Picture Base & Wet Paint Bundle	95.	
Foundation Publishing Comic People	25.	T/Maker Click Art Letters I, Letters II,		
Comic Strip Factory	45.	Personal Graphics, Effects,		
Generic Software Generic CADD	54.	Business Image, or Holidays (each)	28.	
Graphsoft Mini Cad 4.0	375.	Christian Images	35.	
Innovative Data Design Dreams	315.	Click Art EPS Illustrations	75.	
MacDraft 1.2B	149.	Zedcor DeskPaint 2.0	69.	

ArtFonts 1, 2, or 3 by Olduvai

ArtFonts is the affordable, attractive three volume set of 'display' typefaces for PostScript laser printers from Olduvai. Add spice and splash to any document or publication with these unique typefaces, and use the symbols in banners, mastheads, and logos, or as decorative ornaments by themselves. You can use *ArtFonts* in all PostScript graphics programs (such as Illustrator, Cricket Draw or Freehand) to create dazzling special effects. And because all *ArtFonts* automatically download to laser printers, there are no surprises at the last minute. Each of the three volumes consists of six different, lively typefaces and a separate set of symbols.

ArtFonts 1, 2, or 3 .... **59.**

Disk Drives/Hard Disks/Upgrades

Appied Engineering		MacSnap 548S (512E to 2MB w/SCSI)	599.	
MacRAMS		MacSnap Plus 2 (MacPlus to		
(1 MB SIMMS Mac+, SE, II)	489.	2MB Non Expandable)	439.	
AST Research		MacSnap 2SE or 1024 Option		
Mac286 Co-Processor (Mac II)	Call	(1MB or MacII Memory Exp.)	439.	
CMS		SCSI Interface/Port	109.	
Compact Series SC30 (Mac+/SE/II)	649.	MacSnap Toolkit (torx driver,		
Compact Series SC45 (Mac+/SE/II)	859.	opener & grounding set)	15.	
SD Series MacStack SD20 (Mac+/SE/II)	569.	Everex Emac 20D (20Mg Hard Disk)	520.	
SD Series MacStack SD60 (Mac+/SE/II)	849.	Emac 20 Deluxe	585.	
Cutting Edge		Personal Computer Peripherals		
Cutting Edge 800k Drive	Special 175.	Beige or Platinum Color. Optional		
Cutting Edge Wedge XL 30		Built-In Modems Available.		
Plus SCSI Hard Drive	629.	MacBottom HD-21		
Cutting Edge Wedge XL 45		(20+MB SCSI Hard Disk)	Special 659.	
Plus SCSI Hard Drive	829.	MacBottom HD-32		
Cutting Edge XL 30 Internal Hard Drive	505.	(32MB SCSI HD)	Special 699.	
Cutting Edge XL 45 Internal Hard Drive	645.	MacBottom HD-45		
Dove Computer Corporation		(45MB SCSI HD)	Special 859.	
Marathon 020 Accelerator		MacBottom HD-70 (70MB		
MSE 1 (16 Mhz)	585.	SCSI Hard Disk) Plat only	Special 999.	
MSE 2 (16 Mhz w/ 1MB)	1059.	Rodime Rodime 20 Plus Ext.	629.	
MSE 3 (16 Mhz w/ Math Co-processor)	779.	Rodime 45 Plus (Ext. 45MB SCSI)	939.	
MSE 4 (16 Mhz w/ 1MB & Math Chip)	1255.	Rodime 450RX (Int. 45MB Mac SE/II)	829.	
MacSnap 524 (512K to 1MB)	315.	Rodime 100 Plus (Ext. 100MB SCSI)	1169.	
MacSnap 524E (512E to 1MB)	305.	Rodime 140 Plus (Ext. 140MB SCSI)	1319.	
MacSnap 524S (512E to 1MB w/SCSI)	379.	Rodime 1000 RX (Int. 100MB MacII)	1045.	
MacSnap 548 (512K to 2MB)	459.	Video Technology		
MacSnap 548E (512E to 2MB)	549.	Laser 800k External Drive	185.	

FannyMac QT by Mobius

The new *FannyMac QT* by Mobius provides safe, effective cooling for your Macintosh with its low-profile, ultra-quiet fan. It reduces internal temperatures and helps delicate electronic parts last longer, especially the heat-generating Macintosh powerboard. The *FannyMac QT* also has a built-in surge protector which shields your Macintosh from harmful power spikes. Its elegant design fits perfectly inside the Macintosh's handle without compromising the Mac's clean lines and portability. With its low profile design, you'll still be able to put your Mac in its carrying case. Available in Platinum or Beige colors to match your Mac!

Fanny Mac QT .... **65.**

Desk Accessory Programs

Affinity Microsystems			**Imagine Software**	
Tempo II	89.		Multi-User Appointment Diary	
AffiniFile	46.		with Smart Alarms	85.
Beyond Inc. Menu Fonts 2	32.		Smart Alarms & Appointment Diary	35.
Borland SideKick V2.0	65.		**Mainstay**	
Cassady & Greene, Inc.			Think'n Time	61.
HyperDialer	26.		**Olduvai Software**	
QuickDex 1.4A	32.		DA Switcher	25.
CE Software DiskTop 3.0	27.		**Solutions, International**	
Deneba Software			Super Glue	52.
Comment 2.0	54.		SmartScrap & The Clipper 2.0	39.
Electronic Arts Disk Tools Plus	31.		**Symmetry**	
Exodus Software Retriever	55.		HyperDA *(Req. 512K)*	38.

DiskFit by SuperMac Software

DiskFit is the newest solution for hard disk owners in search of flexible, reliable, headache-free backups. *DiskFit* manages the entire backup process —just a few keystrokes and your backup is underway. *DiskFit* uses standard file formats, so your files are immediately accessible — one at a time, or all at once. *DiskFit* is fast enough to back up 50K of file changes in just three minutes. *DiskFit* supports floppies, other hard disks, Bernoulli cartridges, or 3M DC2000 tape cartridges. You can rest assured your data is safe when you have *DiskFit's* reliable, fast, compatible backups on your side!

DiskFit .... **54.**

Accessories

Abaton ProPoint *(ADB Mouse*			Apple Security Kit	34
for Mac SE & Mac II)	99.		Antiglare Polarizing Filter	33
Asher Engineering			Modem/Fax Protector 10	15.
Turbo Trackball *(Mac & Mac+ or*			Modem/Fax Protector 20	29.
Mac SE & Mac II)	69.		Power Tree Surge Suppressors	
CH Products Mirage: Quad or ADB			(10, 20, or 50)	Call
(Turns Joystick Into Mouse)	39.		Printer Muffler Stand *(80 & 132)*	24.
Mach IV Plus: Quad or ADB	65.		Printer Muffler 80	43.
Curtis Manufacturing			System Saver Mac *(Beige or Platinum)*	64.
Emerald-Surge Suppressor-SP-2	36.		Super Base	34.
Ruby-Surge Suppressor-SPF-2	55.		System Saver SE	59.
Cutting Edge Cutting Edge EADB-105			Masterpiece Mac II	105.
Keyboard *(Mac SE & Mac II)*	125.		New Turbo Mouse *(Reg. or ADB)*	119.
DataDesk			**Mobius**	
MAC-101 Keyboard/Beige			Fanny Mac QT *(Beige or Plat.)* **Special**	65.
(128k/512k & MacPlus) **Special**	139.		**Mouse Systems** A+ Mouse *(MacPlus)*	65.
MAC-101 ADB Keyboard/Platinum			A+ ADB Mouse *(Mac SE/Mac II)*	85.
(Mac SE & Mac II) **Special**	139.		Moustrak MousePad 7"x9" Size	8.
Ergotron Mousecleaner 360°	15.		MousePad 9"x 11" Size	9.
MacTilt or MacTilt SE *(Platinum Color)*	68.		**Orange Micro** Grappler C/Mac/GS	79.
Farallon MacRecorder Sound System			Grappler L/Q	92
(Mac SE or Mac II)	139.		**Ribbons**	
Impulse Audio Digitizer w/soundware	149.		*Available in Black, Blue, Brown, Green,*	
I/O Design *Mac Luggage in Navy*			*Orange, Purple, Red, Yellow, Silver & Gold*	
Macinware Plus Carrying Case	64.		ImageWriter Ribbon	4.
Macinware SE Carrying Case	76.		ImageWriter Black 6-pack	20.
Imageware II Carrying Case	49.		ImageWriter Rainbow Pack *(6 Colors)*	20.
HDware	54.		ImageWriter II-Four Color Ribbon	9.
Kalmar Designs			ImageWriter LQ Black	17.
Teakwood Roll-Top Disk Cases:			ImageWriter LQ Four Color	20.
Micro Cabinet *(holds 45 disks)*	14.		Seikosha Ribbon Black	6.
Double Micro Cabinet *(holds 90 disks)*	23.		**Silicon Comforts** MacChimney	
Triple Micro Cabinet *(holds 135 disks)*	32.		*(Very Effective Cardboard*	
Kensington External Disk Drive Cover	8.		*Laminate Convection Cooling Device)*	16.
Extra Long ADB Keyboard Cable	25.		**Smith & Bellows**	
Macintosh II Stand	20.		Mahogany Disk Case *(holds 96)*	30.
Macintosh II Monitor Extension Cable	33.		**Sopris Softworks**	
Mouse Pocket *(Reg. or ADB)*	8.		*High Trek Carry Cases - Platinum Gray, Navy*	
Mouseway *(Mousepad)*	8.		Imagewriter II Case	49.
ImageWriter or ImageWriter II Cover	9.		Macintosh Plus, SE w/Standard Kybd	59.
Macintosh Plus/SE Dust Cover	9.		Macintosh SE & Extended Kybd Case	69.
Macintosh SE w/extended Kybd Cover	9.		**Targus (Canada)**	
Mouse Cleaning Kit w/Pocket	17.		Imagewriter II Carry Case Blk.	45.
Disk Drive Cleaning Kit	20.		Macintosh Plus Carry Case Blk.	59.
Tilt/Swivel	22.		Deluxe MacPlus-XKB Blk.	69.

DataBase Management

Acius 4th Dimension	489.		**Fox Software** Fox Base Plus	209.
4D Runtime	239.		**Ideaform** Hyper Book Maker	31.
Activision Focal Point II	95.		**Microsoft** Microsoft File	119.
Reports for Hypercard	59.		**Nordic** HyperCONTROL	42.
Focal Point & Business Class Bundle	49.		**Odesta** Double Helix II	339.
City To City	30.		GeoQuery or DataDesk Professional	295.
Apple Computer HyperCard	42.		**Park Row Incorporated**	
Ashton Tate dBASE Mac 1.0	295.		Publish or Perish	28.
Blythe Software			**ProVUE Development** OverVUE 2.1E	149.
Omnis 3 Plus/*Express*	275.		**Software Discoveries**	
Borland Reflex Plus	165.		RecordHolderPlus	45.
Claris FileMaker II	239.		**Telegraphics** Hypertutor	29.

Business Software

Abacus Concepts StatView II			**Mainstay**	
(Mac+, SE, II w/68020 & 68881)	369.		Capture	42.
StatView SE+ Graphics	229.		Mac Flow 2.0 or Mac Schedule	115.
Access Technology Trapeze 2.1	159.		**Meta Software** Design/2.0	199.
Ashton Tate Full Impact	249.		**Micro Planning Software**	
Borland Eureka! The Solver	129.		Micro Planner 6.0	349.
BrainPower ArchiText	182.		**Microsoft** Microsoft Excel 1.5	249.
StatView 512 Plus	175.		Microsoft Works 1.1 with Spellswell	189.
Math View Professional	145.		**Satori Software**	
DataScan	119.		Bulk Mailer 3.2	79.
Bravo Technologies MacCalc	79.		Bulk Mailer Plus	195.
Chang Laboratories			Components GL	389.
C.A.T. Contacts•Activities•Time	229.		Legal Billing	369.
Claris MacProject II	395.		Project Billing	409.
Cognition Technology			**Select Micro Systems, Inc.**	
MacSMARTS	135.		Exstatix or MapMaker	219.
D2 Software MacSpin 2.0	189.		**Shana Enterprises**	
Individual 101 Macros For Excel	44.		Fast Forms	89.
Informix Software, Inc. Wingz	349.		**Synex** Mac Envelope 4.0	59.
Legisoft/Nolo Press WillMaker 3.0	35.		Mac Invoice	32.
Lundeen & Associates			**Systat** Systat 3.2	
WorksPlus Commands	60.		*(Specify MacPlus, SE or Mac II)*	459.

Word Processors & Desktop Publishing

Access Technology Mind Write 2.0	95.		**Microsoft** Microsoft Word 4.0	249.
Mind Write Express	149.		**Postcraft International, Inc.**	
Allan Bonadio Associates			Laser FX Font Packs 1-6 ea.	29.
Expressionist 2.0	79.		Laser FX	115.
Aldus Corporation			**Quark, Inc.** QuarkXPress V2.0	499.
PageMaker 3.0	399.		**Silicon Beach Software**	
Ashton Tate			Silicon Press	41.
FullWrite Professional	269.		**Symantec** More II	Call
Claris MacWrite 5.0	105.		**Symmetry** Acta V2.0	42.
Letraset			**T/Maker Company**	
Ready, Set, Go! 4.5	279.		WriteNow V2.0	109.
Letra Studio	369.		**Word Perfect Corporation**	
LetraFonts *(Various Vol. 1-45 ea.)*	69.		Word Perfect	185.

Spelling & Grammar Checkers

Aegis Development			**Electronic Arts** Thunder! 1.23	30.
Doug Clapp's Word Tools	42.		**Lundeen & Associates**	
A.L.P. Systems			WorksPlus Spell 1.1	46.
MacProof 3.0	115.		**Microlytics, Inc.**	
Deneba Software			Word Finder *(Synonym Finder)*	35.
Coach Merriam Webster's Thesaurus 2.0	36.		**Sensible Software** Sensible Grammar	55.
Spelling Coach 3.0			**Working Software**	
(Webster's/Medical/Legal/Hyphenation)	54.		Spellswell 2.0	45.
Spelling Coach 3.0 Professional	109.		Lookup *(Makes Spelling Suggestions)*	29.

the transition from a tiny company operating out of a garage to a multibillion-dollar corporation. Apple not only survived but also prospered after the departure of Steve Jobs and the transfer of power to a different kind of visionary, John Sculley. When it could, Apple provided its customers with upgrade paths to give them the benefits of new technologies. Apple has continued to innovate, to explore new directions, to try new strategies. It has grown into a company that not only wants to change the world but also is better positioned than ever before to realize that change.

Apple has my respect. And they got it the old-fashioned way. They earned it.

PINSTRIPE PICKS
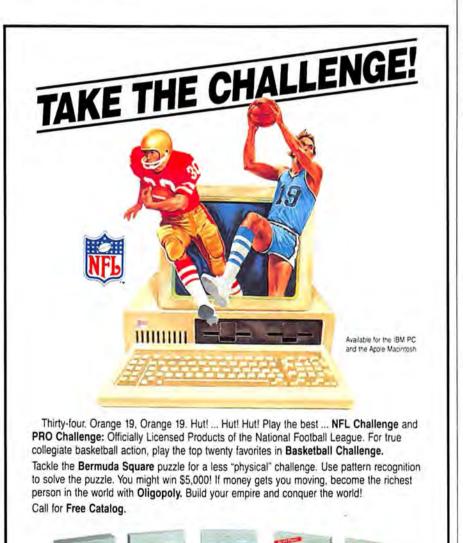
Just as Apple has changed over the years, so has *MacUser*. You may have noticed in the past few months that the Pinstripe Picks section of this column has grown and provides more information about the products. The products picked for inclusion here are business-oriented products worth a look if you use your Macintosh for business. I am not necessarily endorsing these products, so the "thumbs-up" have been dropped. I encourage you to find out more about the products mentioned here. Check the MiniFinders for more information, and look elsewhere in the magazine for in-depth reviews.

Adobe Type Library: (Adobe) The people who developed PostScript offer a large and varied selection of typefaces for use with LaserWriters and other PostScript printers. These fonts are well-designed, and each comes with a complete set of screen fonts so you can enjoy true "What You See Is What You Get."

The typefaces are not cheap, but Adobe offers several packages of fonts that go well together at a discount. You can even buy the complete collection on a hard disk, ready to be attached to a LaserWriter IINTX.

Trapeze: (Access Technology) Version 2.1 of this free-form spreadsheet has an improved user interface; more font, style, and color flexibility; and full MultiFinder compatibility, including background calculation. When the quality of your output is as important as the numbers themselves, Trapeze may be the tool you need.

MacWEEK: (Ziff-Davis) If you need to stay on top of the Macintosh market, this tabloid weekly provides a nice complement to *MacUser*. *MacWEEK* is more news-oriented than *MacUser*, and it's an excellent source of up-to-the-minute news about what's going on in the Macintosh world. Best of all, if you qualify the subscription is free, but even the normal subscription rate of $75 per year is reasonable. ▨

They all have

Conventional wisdom tells us that just like shoes, there's no such thing as one-size-fits-all software. People have distinct workstyles, and varying levels of Macintosh® proficiency. And when you take into account the many types who create presentations, from executives to educators, artists to accountants, it would seem impossible to find a desktop presentation package that suits them all.

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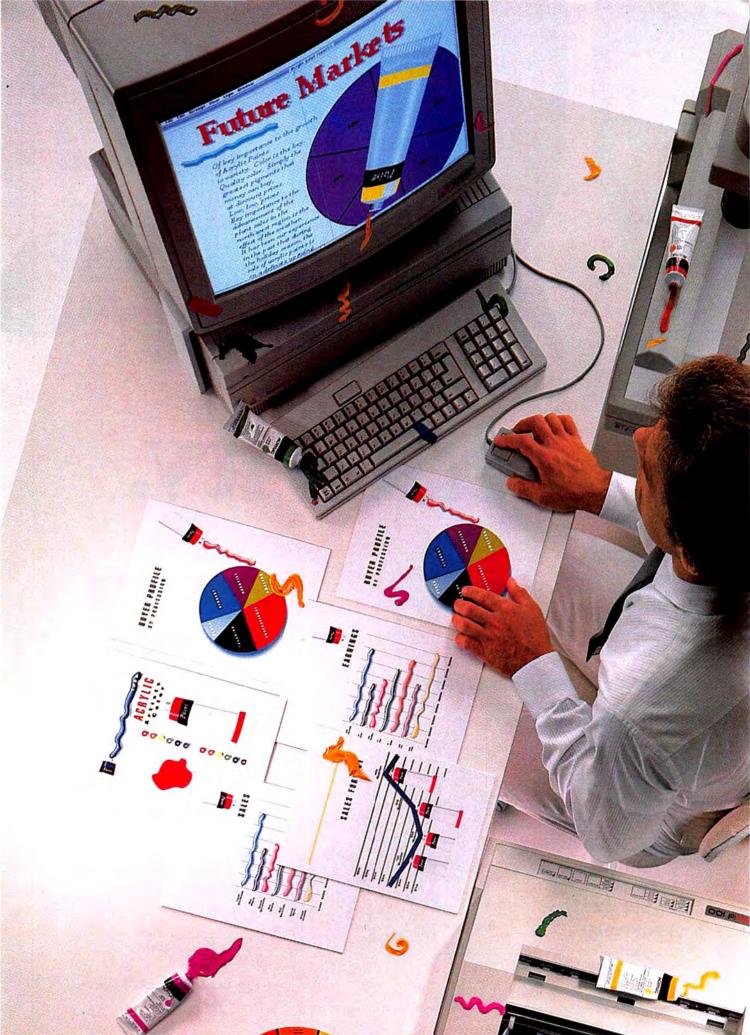
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A Mac of Many Colors

The color Mac. It seemed like a long time coming, and now it's some distance past, but time is accelerated in the computer industry. The astonishing fact is that, for half of its lifetime now, the Mac has been sporting multicolored glasses. Despite its black-and-white heritage (and many users' preference for the same), the maverick Mac has muscled up in its visual impact and, in the process, expanded its range. The Mac II — and its sibling, the IIx — can now display color on dozens of different monitors, read graphics photos from color scanners, and produce output from digitizers, film recorders, and printers — all fueled by advanced and innovative software for graphics, publishing, and presentation. Even so, color is still uncharted territory for many users, and a host of developers haven't yet explored the full nature of color on the Macintosh.

BY TONY REVEAUX

MEL LINDSTROM

TALES FROM THE INTERFACE ZONE

The first Macintosh was designed to be an advanced black-and-white machine, with only rudimentary built-in support for color. The original Quick-Draw, the Mac's screen-display language, could define eight colors that were used when printing out on an ImageWriter equipped with a color ribbon. But from the very beginning, the Mac team had always lusted for full, professional color capabilities. Within a year after the original Mac was announced, they had both a gray-scale and a color prototype computer up and running.

Apple's Advanced Technology Group explored the different ways color could be used, such as in educational applications of multimedia. When they set out, there were no guidelines to show them how color could be implemented in a logical, consistent way that would satisfy everyone. At the time, the high-end graphics worksta-tions from leaders like Sun Microsystems and Apollo displayed just the foreground color and the background color, without any mapping in between.

Apple took all the interface elements and broke them into categories to see how many ways color could be applied to elements like icons, scroll bars, and title bars. Unlike the wide-open frontier of the Apple II, the Macintosh system was held to a consistent and controlled user interface, where everything had to function clearly in black-and-white. Color was just another dimension that added an extra layer of information — considered superfluous by some.

BASIC ADDITION

Movies, television, and print recreate the color of the real world in critically different ways. As with TV, color on a Mac II is additive; however, unlike a television monitor that must ad-here to National Television Standards Committee (NTSC) standards, color, brightness and synchronization signals are not combined into one NTSC signal. Beams of RGB light, sent from separate electron guns, are mixed together on the phosphor-coated image mask of the monitor to create other colors. Overlapping areas of red, green, and blue mix to yield white where all three converge and yield colors like yellow, cyan, magenta, violet, and orange where two overlap. The computer, like the TV monitor, creates the colors directly.

Color in movies is both *subtractive* and *additive.* It is subtractive at the point of fixing the emulsion on the film and additive in the act of being projected and reflected off a screen. Color from a printing press, where colors are being laid on top of one another, is subtractive; ink absorbs colors from the visible spectrum of light and reflects back what isn't absorbed. Derived from a four-color separation, successive layers of CYMK (cyan, yellow, magenta, and black) inks — screened in different densities — combine degrees of opacity and transparency, reflecting and absorbing light that we perceive as a full-color illustration or photograph. The greatest challenge in computer-aided publishing is getting color displayed on the screen to match what finally dries on paper.

COLOR COORDINATING

Unlike its monochrome equivalent, the System for the Mac II displays a Color menu at the Finder level. This menu lets you "color" any folders or files in a choice of eight hues — orange, red, pink, light blue, blue, green, brown, and black. The Color menu is active in both the 16- and 256-color modes and in any application that supports color. The eight interface colors were based upon the output of the ImageWriter with a color ribbon.

You've heard, "16.8 million colors on the Mac II!" — and it's true. The ROM theoretically enables you to have them all. But your 8-bit video card lets you display only 256 colors at any one time, even though you have millions to choose from. (With a 24-bit card and a 1,024-x-768-pixel, 19-inch

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Picking Your Hues

As far as a Macintosh is concerned, color is made up of three elements:
- *Hue* is what is usually meant by "color" — whether it's red, blue, green, or yellow, and so on.
- *Saturation* is the purity of a color — rich, intense colors are highly saturated; dull or diluted colors are not very saturated. For example, pink is a low-saturation red; navy blue is a high saturation blue.
- *Brightness* is how light or dark a color is — how much white is in it. Some pure hues are naturally brighter than others: yellow is the lightest hue, violet is the darkest.

Color Picker is able to pick a color through combined hue, saturation, and brightness values as defined above. Alternatively, you may enter absolute values for the red, green, and blue guns inside the monitor. Or you can click on the color you seek as displayed on the color wheel, with brightness variable across the scroll bar on the right.

Hue	43441
Saturation	62942
Brightness	65535
Red	2594
Green	4033
Blue	65535

Select a highlight color.

The Color Picker is at the heart of accessing any one of the Mac II's 16.8 million colors. You can either click on a spot on the color wheel or cycle through the numbers in the lower-left corner to select a particular hue.

Nobody reads copy anyway. MacDraw II.

■ **A Mac of Many Colors**

Colorizer comes with several preset templates to dress up your desktop in different color schemes. Shown here is the Control Panel resource that chooses those templates.

ColorDesk in the Screen Gems package lets you replace the gray desktop with something more colorful. The companion program, TN-3, makes wholesale changes of the color of icons on the desktop.

The legacy of '60s psychedelia is seen in Intelligent Music's OvalTune. The color-image generator is keyed to producing random graphics and sounds within parameters set by the user.

monitor, you can display up to 786,432 colors simultaneously.) The magic words to get at those millions are *Color Picker*. This device is used by several color software packages as well as by the Macintosh operating system. To take a quick look, go to the Control Panel and select the palette-shaped Color icon. This opens up the deceptively simple Change Color window, which controls the highlight color that shows up in a file or folder name when it is selected on the desktop. If you want to change that highlight, a click opens up the Color Picker window. It shows a color-wheel disk, brightness-control scroll bar, and calibration controls for hue, saturation, and brightness, as well as for red, green, and blue.

To get a taste of the tremendous range of colors now available to you, click and drag the cursor — now a *hot spot* pointer — to different areas of the wheel. The new color box will change color depending on where the hot spot is. Or click on an arrow of the hue box and hold it. The hot spot will slowly orbit the outer spectrum of the wheel. From 0 to 65535, those five-digit numbers displayed in each of the six boxes represent the values as the circular spectrum is subdivided into that many visible differences. The way most people use this calibration is in recording and being able to return to a specific combination of color factors. It's an easy notation to record, and each color can be recalled by typing in its number. Because of the limitations of the current System, it is not unusual to find a discernable shift in the chosen color when you return to the application.

The simple scroll bar for brightness control actually represents a cone-shaped color space. At the top of the bar would be the largest area of the cone with all the colors in their maximum brightness. As you travel down the bar, or the diminishing tapered area of the imaginary cone, you are visually less able to distinguish the differences between them. In a possible advanced version of the Color Picker, according to a software engineer at Apple, that scroll bar could display the form of a three-dimensional cone or cylinder, where the location of the hot

■ A Mac of Many Colors

spot would be revealed in depth just as it is now in the existing flat, two-dimensional disk. A new Picker would also show the different ways that a color could be used on the screen: e.g., in a solid area, in a fine line, or as text, for example.

IN LIVING 3-D

An even more fundamental and philosophical issue underlies color on the Mac — the very nature of the color model itself. The current Picker is designed after an image-processing model and is based upon the mathematically derived RGB system. These standards are color spaces obtained from the consistent, incremental subdivision of visible spectral bands. Based upon the physics of light, RGB is used most often for CRT and video displays in this country.

A perceptual model like the Munsell color system, based upon the physiology of human vision, shows you only the colors that your eye can differentiate. Interpreting our subjective perception of reflected light, this model is used widely in government and industry and is the one most familiar to artists and designers. A three-dimensional diagram of the Munsell color solid looks like a spheroid. It breaks down individual colors in terms of hue, value, and chroma — but only in steps that are perceptible to the average viewer. The blues that the RGB Mac II currently displays, for instance, are too close together for most people to discriminate between, and many yellows appear the

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Color Blind?

A t first glance, Apple's approach to color in the Mac interface may seem excessively parochial — witness the exclusion of the Kolor CDEV from official System release. This tool, devised by Russ Wetmore, lets users assign colors of their choice to over a dozen components of the Macintosh interface. Virtually all the Macintosh II users here at *MacUser* have used Kolor to customize their desktops.

But interface purists are concerned by the potential abuses of a tool such as Kolor. They point out that while color is an extremely valuable additional channel of information to the Mac user, its use in the desktop interface itself must be monitored very carefully. Gratuitous use of color can actually have the opposite of an intended effect, causing confusion rather than clarification. In an informal survey, four out of five Kolor users themselves agreed that poor use of color is worse than no color at all.

Apple's publication *Human Interface Guidelines: The Apple Desktop Interface* illuminates several important points and identifies potential pitfalls in the use of color on the Macintosh. Among them are the following:

• Unless you are implementing a color application such as a paint or draw program, you should consider color only for the data and not for the interface itself.

• You should design your application first in black and white. Color should be supplementary, providing extra information for those users who have color. Color should never be the sole delineator between two objects. There should always be other cues, such as shape, location, pattern, or sound.

• Studies show that the mind can effectively follow only four to seven color assignments on the screen at once.

• In general, limit color use outside of actual graphics applications. Provide the user with a small initial selection of distinct colors and the capability to change them or add more.

• Be aware that, in some cases, attracting the eye might not be what you want to do. For example, if "dangerous" menu items are colored red, the user's eye will actually be attracted to the red items, and the user might be more likely to select those items by mistake.

• Reading and legibility studies in the paper world show that colored text is harder to read than black text on a white background. This also appears to be true in the computer domain.

• The most illegible color is light blue, which should be avoided for text, thin lines, and small shapes (unless you actively seek the unobtrusive, such as the look of graph paper).

NewsletterMaker
Pictures that really make headlines. Seasonal, educational, holiday and sports symbols. Images to illustrate almost any occasion.

Computers & Technology
Images of people computing, monitors and keyboards, satellites and astronauts, research laboratories and more.

The Four Seasons
A year full of images. Holidays and holy days, sandcastles and snowmen, flowers and fireplaces, budding trees and falling leaves.

Art Deco
Genuine advertising images from the thirties, designed to jazz up any document. Stylized illustrations of dining and dancing, cityscapes, carhops and crooners.

People
It takes all kinds. The long and the short, the big and the small. Men, women, children, grandparents. Eating, shopping, working, playing and more.

Team Sports
Images you can run with. Everything from football to hockey, baseball bats to lacrosse sticks, cheerleaders megaphones, hot dogs, and more.

Weekend Sports
Images from under the sea and up in the air. Snorkeling, ballooning, tobogganing, hiking, biking, fishing and more.

Business Graphics
Serious and not so serious images to work with. Offices and office equipment, managers and meetings, financial symbols, and more.

ReportMaker
Political, social, industrial, agricultural and financial symbols. A collection of images to give your reports more impact.

Nine to Five
Pictures that really work hard. Computers and commuters, brown-bag and business lunches, secretaries and senior executives, clocks and calculators, and more.

Borders & Boxes
Decorative signs, symbols, corners, bursts, borders and more. For framing any document.

Exercise & Fitness
For getting your documents in shape. Pictures of jogging, aerobics, exercise equipment, health food, vitamins and much more.

Travel
For taking your documents in new directions. Planes, trains and auto-mobiles, exotic destinations, stations and suitcases.

Food
A generous serving of images. From soup to nuts, waiters and chefs, banquets and barbecues, borders and more. Great for menu design.

same. A perceptual color model for the future and a new Color Picker will most likely be based on the Munsell color system.

Colors not only change from one brand of monitor to another but are also influenced by factors like the effects of daylight or fluorescent light in the room. There is a continual interaction of colors going on as light reflects and rebounds from every surface — such as the walls, and even your shirt. Even as we age, color perception "yellows" as we lose perception of blue. Colors can also have different cultural connotations. White can be the new bride's veil in one country and the shroud of mourning in another. Yellow can be the pennant of victory or the badge of the outcast, or it can signify memories of the missing.

COLOR IN THE WORKPLACE

We live in a universe of color, and color dominates the media surrounding us — art, television, magazines, newspapers, and outdoor advertising. But is it worth all the extra cost, complexity, and overhead to add it to your system? The definitive answer has come back from businesses: Yes.

According to a recent survey by SDD Burke for Hewlett-Packard, businesspeople are quite ready and willing to face up to that extra expense. Of those customers, 55 percent use a color monitor, 83 percent believe color adds impact to presentations, 60 percent see color as increasing productivity, and 30 percent claim color hard copy is currently required.
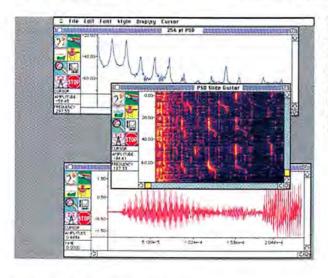
For games and education — like the thousands of programs running on Ap-

ple IIs, Ataris, and Commodores — color screen display is enough. But output is the definitive product in business, and the success of desktop publishing ultimately hinges on output. Color output is divided among film, as in transparencies for slides, overheads, and publishing; color hard copy; and four-color linotronic output. Unfortunately, it will be some time before there's a desktop-imaging system that has that mix of the right quality, production capability, and price to provide a full-service color-printing function for the corporate and service bureau levels.
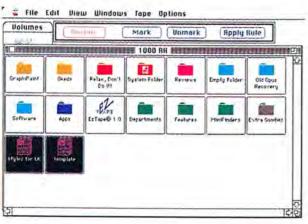
Another problem in dealing with color is the issue of four-color separation. No desktop printer available can give high-quality four-color separations (a combination of the resolution and the color generation technology). Should you just send out your art for separations? This all depends on what you want in terms of output. Doing it in-house on a desktop-publishing system, you'll have to design your spot illustrations with the expectation that the separation will come back with a somewhat jagged, grainy image. There needs to be a quantum improvement in imaging engines: something that does 100 impressions per minute, does process color as well as spot color for the equivalent of a six-head press, and has binding capability. At that point — with a cost of about $30,000 — there can be a substantial market potential. A full-featured, in-house digital printing press does not yet exist.

In the near term, we may see improved color imaging for the production of color masters, especially when the reproduction process doesn't require traditional separation print processes. Slides, or a design presentation like a comprehensive layout or a packaging comp — these are all perfect applications for color. This provides economy of scale for the business decisions to be made with quick in-house turnaround time for revisions before final production and finishing.

For slides and hard copy, the use of standardized color catalogs like the Pantone Matching System (PMS) are being used to communicate information between designers and producers

Color is used to the hilt in Spectral Innovation's MacDSP, a floating-point digital-signal–processing system. This spectogram, complete with color icons, shows the bending frequency components of music from a slide guitar.

The software that drives the Irwin Magnetics DC2000 tape drive will back up your files according to the color of the file or folder's icon.

on the specifications of the finished piece. The match will not be perfect — even with traditional finishing printers — but it will be perceptually correct. The following applications include Pantone palettes: LaserPaint, Illustrator 88, QuarkXPress, FreeHand 2.0, LetraStudio, and the Genigraphics Corp. service bureau.

Software developers, led by Jim Von Ehr II, President of Altsys Corp. of Plano, Tex., have begun to work toward a concordance for industry standards in color. "We have already agreed with Adobe for color Encapsulated PostScript Format (EPSF) specs," he said. "Beyond that, I'm not sure where we're headed. Perhaps a color system replacing Pantone, something that can tie the screen and the printed page closer together." Computers like the Mac II cannot display the full range of Pantone colors, but users who are in the graphic arts feel familiar with that traditional system. So in practice, they rely upon their standard Pantone color-chip charts for the specification numbers they send to the printer, since the shades on the screen are considered approximate at best.

WYSIMOLWYG V. WYSIWYG

The advantage of computerizing color-graphics production is found not so much in close and critical color design, matching, and correction as in jobs where operations such as layout, editing, and separation can be automated. Rather than true WYSIWYG, the reality is WYSIMOLWYG (What You See Is More Or Less What You Get).

The advent of video publishing — reading articles at a terminal — represents that end point where what you see on the screen is the finished piece, and one that may never see a printed page. The entire communication — from author to designer to consumer/reader — would be based upon that display medium to create, read, and respond to it. And that mode would be WYSIAYWEG (What You See Is All You Will Ever Get). ▨

TONY REVEAUX IS A FREELANCE WRITER BASED IN SAN FRANCISCO.

Paint It Black?

Just because you have an SE or Plus doesn't mean you can't work with color applications. All you need is some faith, imagination, money, and a lot of patience.

Ted Turner has given color a bad name. Going through all the expense and trouble of colorizing the old black-and-white MGM films produced poor results that left fans of those flicks feeling disappointed. Apparently, there's something to be said for those who prefer black-and-white pictures.

Trying to convince Mac Plus and SE users of this, however, is like telling them to be satisfied with black-and-white television. I mean, you now have the Mac II with all its color capabilities, and you're probably salivating over having the same thing for your SE or Plus. What should you do? Well, if you're a big-time graphic artist, the options mentioned here are not really for you. On the other hand, if you have occasional need for color on your Mac, then you'll want to examine the possibilities discussed here.

Can you have color on your SE or

MEL LINDSTROM

BY KRISTI COALE

■ **Paint It Black?**

Plus? Well, back in the 1950s you had instant color television with the Magic Screen. You slid this screen in front of your regular television screen and, presto, you had color (assuming the sky was always blue, the ground always green, and that you didn't mind much if people on-screen had a greenish hue). A similar sleight of hand will give you color on an SE, but with better results. With the SE you have the option of hooking up the Colorvue SE card from Orchid Technology, which allows your SE (hooked up to a color monitor) to display the eight Quick-Draw colors (cyan, magenta, blue, green, red, yellow, black, and white). But before you go out and spend $695 on a Colorvue card, you should take a step back and consider your other color alternatives (see related sidebars). Are you more concerned with getting color display or color output?

BLACK, WHITE, AND COLOR ALL OVER

Remember kindergarten when you got to make a color image by grating your Crayolas, placing the pieces between two sheets of wax paper, and going over the whole mess with a hot iron? When you were a kid, you might have thought this was neat (figuratively speaking), and you may still find it so. When you look back, however, it does seem like a lot of trouble to go to just to get a color image. In point of fact, getting a color display on an SE is as involved a process as your hot iron creation (although you won't have to ruin your box of 64 Crayolas, $3.50, sharpener included) and can be a real pain in the aft. You'll have to take apart your SE and attach the Colorvue SE card to the logic board. Then, you'll have to get a color monitor. So break out your pocketbook, 'cause you'll be shelling out a few hundred dollars before you're through.

Seem like an experiment in pricing to you? Well, let's do this right and set a control group: a Mac II (complete with Apple color monitor, keyboard, video card, and video expansion kit), which sells for $8,245 (Apple prices — $4,640 on the street). Now, you've already paid $4,298 for your SE (again, Apple price; you can get one elsewhere
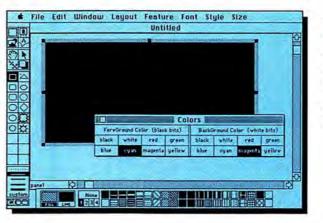
If you want 16-color images, you'll need applications written specifically for the Colorvue.
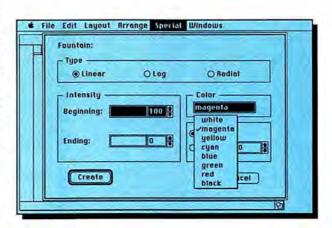
for around $2,450). Let's see how this all adds up. The Colorvue SE board costs $695 and works with either the Apple High Resolution RGB (Mac II) color monitor or an EGA monitor (for PCs). The monitor from Apple is yours for $999; you can get by more cheaply, though, with an EGA monitor for $350 to $450 (from companies like Samsung). For those of you keeping
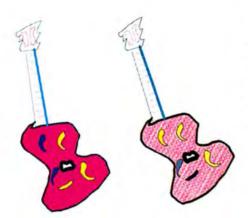
score, that's Mac II $8,245, Mac SE and company $6,392 or $5,892, depending on the monitor and on whether you're looking at Apple prices. The difference is still around $2,000.

Having invested all this money, you're ready to hook up the Colorvue SE. Orchid instructs you to have a trained technician install the board; however, after thumbing through the instruction manual (very straightforward), you might want to install it yourself. It's pretty easy. Just be careful not to touch the high-voltage cathode ray tube (there are a host of warnings to keep you away from this) or the red power line along the side of the cathode ray tube — you could wind up getting a quick perm if you do. Once you've completed this process, all you need to do is drop the Colorvue SE cdev in your System Folder, pull up your Control Panel and select the Colorvue SE icon, reboot your Mac (make sure you've hooked up your monitor — the Colorvue has a jack for

Programs like Cricket Draw and GraphicWorks give you labeled color menus to let you select for fill and for ink. It's a lot easier to see in color, but if a Plus is all you have, then the label is what you have to trust.

Using a color ribbon on the ImageWriter II, you will get printouts in colors the ImageWriter II thinks you want. As you can see, magenta on screen (left) isn't as sharp when printed out (right).

Color Processing in Seconds

How would you like color graphics in your laser-printed documents? Graphics created on your SE or Plus? Sure, I'd believe that almost as much as I believe Elvis is still alive. But seriously, you can do this by taking your LaserWriter output, placing a color foil over it, and running it through the Kroy Color Plus, a compact processor that uses heat and pressure to apply color to images.

The Kroy Color Plus quickly applies gloss and mat color as well as metallic foils to the dry toner image on your LaserWriter output (a Hewlett-Packard LaserJet also works) and to the output of most desktop photocopiers (some, however, like the high-speed Xerox and Kodak copiers, fuse oil with toner and are not acceptable). You can choose among 60 colors — gloss (11 colors), mat (35 colors), and metallic foil (14 colors).

Applying color to your documents is easy. Print out your laser or photocopy, select the area you want to color, and pick an appropriate color film sheet. The color films are composed of two sheets sandwiched together with the film side on the top. The document is placed between the "sandwich," printed side up, and passed through the Kroy processor, which applies even heat and pressure. The color adheres only to the areas where toner exists. The whole process takes less than 30 seconds.

You can color a whole page, spot color, or have multicolor images by using scissors or an X-acto knife and cutting the film to conform to the desired shapes. Post-it notes will hold down the pieces without affecting the impression, or you can use a special clear Mylar carrier sheet for easy placement. One important note, however: Don't try using these foils on your LaserWriter — they may damage it beyond repair.

Considering the time spent bringing copy to the printer, and the wait, the Color Plus is a bargain. Metallic foils are where the Color Plus shines. A local printer quoted $170 to foil a 2-by-6-inch area. The same printer quoted a whopping $460 to print a full page in foil. A box of metallic Kroy foils at $65.95 gives you substantial savings, not to mention sparing you the usual three-week wait for foil stamping. Another advantage of Kroy films is that as long as there are pieces of unused film left on the sheet, they can be reused. I didn't notice a reduction in quality when I passed a film sheet through the processor six times.

There are a few limitations, though. If you are only using spot color on a few areas, you must mask out the remaining areas of your document with paper or tape if you do not want the offset appearance. This can be tricky for complex documents. Also, if you want different colors on the same page, you're going to have a lot of cutting and pasting to do (and I don't mean the choices under the Edit menu). You're also limited in your choice of colors.

The basic model of the Color Plus ($875) only does letter-size paper; the Kolor Processor ($1,295) accommodates legal-size paper (the film for both models is only letter size). Kroy offers free technical support with a toll-free number: (800) 328-1306. You can order materials from a Kroy dealer, or if one does not exist in your area, you can order directly from Kroy. — *Don Rittner*
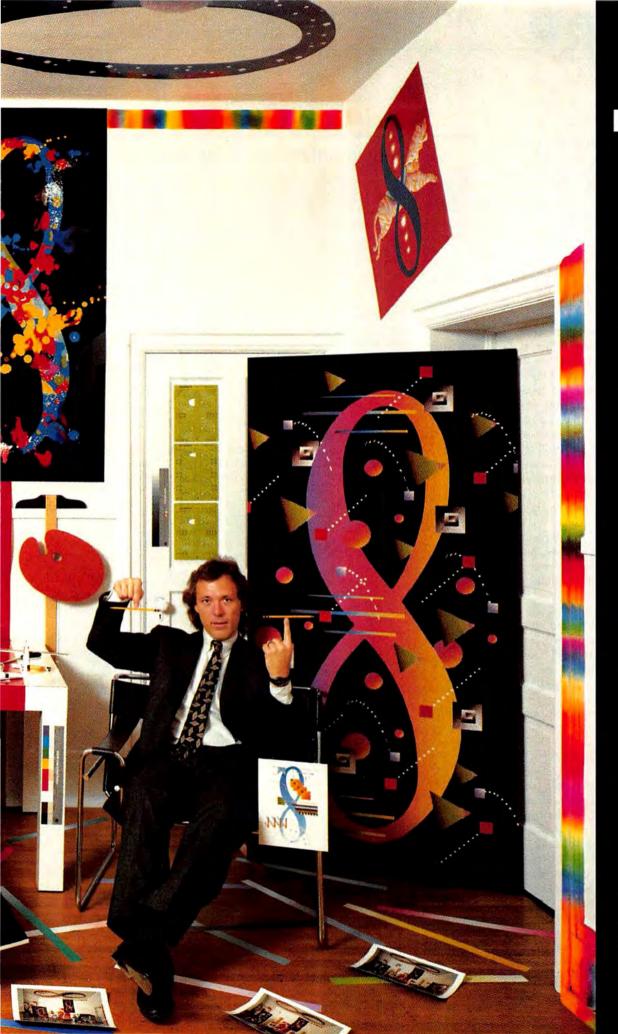
you to attach cables for the Apple or EGA monitor), and you're set.

You can choose the type of display you get from the Colorvue card in the Control Panel under Characteristics of Display — 2 colors (black and white), 8 colors, or 16 colors. Eight-color display is suited for QuickDraw color applications and for printing out on the ImageWriter II and LQ. If you want the 16-color images, you'll need applications written specifically for the Colorvue.

You'll notice some differences in the operation of your Mac. When Colorvue is active, all operations are slower, even when you're not working on an art application. There are delays in getting the pull-down menus, in opening windows, and in launching applications. Remember, you have a new screen to work with, so you'll have to get used to looking to one side or the other of your SE's screen for your display. Because you have this larger screen, your SE screen thinks it, too, can show a larger display — but it can't. You'll see the Apple menu and the other pull-down menus, but you won't find your Trash or your hard-disk icons. These will be visible only on your external monitor. As a rule of thumb, you should disable Colorvue if you're going to be working on things other than graphics. This will save you many a headache (literally) from looking at the wrong monitor and expecting it to act normally. Besides, the display on the large monitor jiggles. Are you sure you still want color on your SE?

THE 22-PERCENT SOLUTION?

You've hooked up your Colorvue SE and found it works in driving your color monitor (you'll see eight colors and the word *Colorvue* SE below them on the opening screen), and you're proud of yourself for saving about $2,000 by not buying a Mac II. But how will this work with the color applications?

Sorry to break this news to you, but you won't see color in Aldus FreeHand or Adobe Illustratcr, no matter whether you choose 8- or 16-color display. While you can open up and work with these applications on your SE (with or without Colorvue) or Plus, these pro-

Reinventing the Color Wheel

While you can get a color display on your SE with the Colorvue SE card, what can you do with your Plus? Well, no matter what you may try, you won't be able to get color on-screen. Consequently, you're left having to apply the Ted Turner principle — colorizing your images after they've been produced in black-and-white on your Plus.

What sort of alternatives do you have with the Turner school of colorization? You can use programs that will color-blindly "colorize" graphics imported from other drawing applications, or applications that let you color-blindly choose your color on-screen. For output, you can use color foils. You should keep in mind that for the former two choices, you will be working *with* color, not *in* color. That is, you will see the names of the colors on-screen, but you won't see the color.

Back when you had only a limited choice of graphics applications, namely Claris' MacDraw or MacPaint and Ashton-Tate's FullPaint, among others, you didn't have the opportunity to see even the names of colors on the screen. Filling the void that was later inhabited by Cricket Draw, *et al* (incorporating graphic capabilities with a color palette) was Colormate by SoftStyle. While not a stand-alone drawing application, Colormate does let you import documents created in FullPaint, MacDraw, MacPaint, and even MacWrite via the Clipboard. With a choice of blue, violet, green, yellow, orange, or red, you can use a paint bucket, rectangle, lasso, or pencil to "colorize" your creation.

One limitation of this package is that only one screen's worth of information will transfer into a Colormate document. Still available for the color-desperate, Colormate sells for $48 and works all right on the Plus and SE (it was created with the 128K in mind).

Several other applications allow you to work color-blindly with color. (And if this doesn't make sense to you — don't adjust your set — just read on.) Programs like GraphicWorks 1.0, Drawing Table (beta version), Cricket Draw 1.1, PowerPoint 2.0, StandOut! (formerly ReadySetShow 1.0), MacDraw II 1.0, SuperPaint (1.0 and later), Canvas 1.02, and Draw it again, Sam 2.04 allow you to select colors by name from a palette containing the names of the QuickDraw colors. Other applications, like FreeHand 1.0 and Illustrator 88, offer a full array of Pantone colors along with other color families (make sure you have a PMS guide when selecting colors from these programs). But no matter which type of "color" application you use, you won't see the colors on screen: You're merely selecting the name of the color for each given object.

Want to see the results? What type of output do you require? Short of buying your own printer, you can go to a local service bureau that happens to have one and print out your work. While it may cost about $8 per page (in the San Francisco Bay Area), this method of checking your work can be costly, especially if you're dissatisfied with your work and decide to make changes. It also means effort expended in finding this special service bureau and getting there.

If you're not interested in high-quality output and just want a color printout of your work, you can look into using an ImageWriter with a color ribbon (for more information on output, see the main article).

Foiled again? Only if you want to be. When it comes to foiling with your Mac-created images, you have a couple of choices if you own a laser printer. There's Color Transfer from Wing Color ($49.95). This is a set of foils that comes in nine different metallic colors that are placed over your laser printer output. You then run your image through the laser printer a second time (select a blank document to print from your Mac). Everywhere there's black ink will now be filled with the color from the foil. The limit here is that you can only get one color per image. There's also a matter of wear and tear on the laser printer. Although Wing claims that the foils won't harm the drum or rollers, you'd best exercise some caution when fitting the foils over the paper.

Another desperate measure you can take is to put color toner in your LaserWriter (any model). Again, this is limiting in that you get only one color per image, and you have a choice of only brown or blue. You'll have to look around for color toner cartridges, as not all supply stores carry them. In some places, these cartridges cost around $180. Other places that refill cartridges may charge you only $90 to give you color toner instead of black. They might also sell new color cartridges.

■ **Paint It Black?**

grams support the color of the Mac II; consequently, they offer more choices among colors than the Colorvue SE recognizes. And don't expect to work on SuperMac's PixelPaint, Modern Artist from Computer Friends, or other graphics applications designed with the Mac II in mind. These can be opened only on a Mac II. (The Colorvue SE doesn't change the ROMs in your Mac SE, just the number of colors it will display. Changing them to the Mac II ROMs won't solve your problems either, as the II ROMs were written for a completely different hardware configuration than can exist in the SE.)

The following applications support the Colorvue SE: Mindscape's GraphicWorks 1.0, Broderbund's Drawing Table (beta version), Cricket Software's Cricket Draw 1.1, Microsoft's PowerPoint 2.0, StandOut! (formerly ReadySetShow 1.0) from Letraset, MacDraw II (version 1.0) from Claris, SuperPaint (1.0 and later) from Silicon Beach, Deneba's Canvas 1.02, and Aba's Draw it again, Sam 2.04, each in a different fashion. [*SuperPaint has a Color Preview mode that, provided you have the SE with the Colorvue card, will let you see your completed image in color on-screen. However, you cannot work in color with this application no matter what model of Mac you're using. — Ed.*] StandOut!, Canvas, Drawing Table, and Draw it again, Sam will not only give you on-screen color, but they'll also print patterns selected and shown on-screen. The others display the fill patterns only on-screen — you won't see them in a printout.
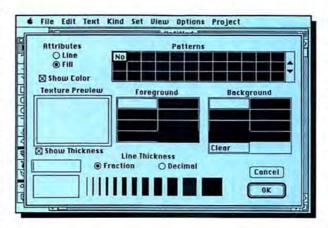
PUT OUT ABOUT OUTPUT?
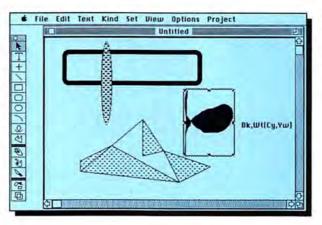
When it comes to printing your images created while using the Colorvue SE, you won't find that "what you see is what you get." If you have the money to get the QMS ($24,995) or Tektronics ($8,495 for the 4693D) color printer, you can output the colors you see on-screen. But seeing that you're trying to save money, this purchase would hardly make sense. Since you're running on a budget, you'll probably want to consider the ImageWriter II ($595) outfitted with a color ribbon

($13). However, Apple is not the only player in the market. Hewlett-Packard offers the PaintJet ink-jet printer for $1,395. You can get drivers from SoftStyle (Printworks for the Mac, for $75) or from Cricket Software (price not available at press time). Toshiba also offers a color printer for use with Printworks for $1,199.
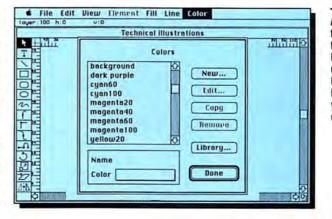
For the purposes of testing output, I used the ImageWriter II. The output

you'll get from this is pretty nice, but it isn't quite what you expect. The ribbon comes with black, yellow, red, and blue. When printing an image, the ImageWriter takes four passes, creating colors it thinks are like those shown on the screen. For example, you'll see magenta on-screen, but the ImageWriter will give you a deep pink, not as bright as what you see on the monitor. This is the typical problem of on-

Some of the programs that let you choose color in a color-blind fashion really put you through a lot of guesswork. In Drawing Table, you double-click within an image to get a preferences dialog box (top) where you can choose fill and line patterns along with colors for each. The problem is, if you have a black-and-white screen, you can't see the blocks of color. You can only tell what colors you've chosen when you go back to the drawing and see the abbreviations for the colors in parentheses (bottom).

Although you won't see the color on-screen with the Colorvue SE card in FreeHand, you can select colors from the library. But make sure you have the PMS guide handy so you know what you're choosing.

When it comes to electronic mail, InBox is TOPS.

■ **Paint It Black?**

GNP for the European Economic Community, 4th quarter of 1988

GNP for the European Economic Community, 4th quarter of 1988

Even with presentation purchases, you can't always get what you want. Note the difference between StandOut! on-screen (above) and the print-out (below).

screen, backlit images versus color printed on a page.

Among other problems I noted: the ImageWriter would not print pattern fills for MacDraw II, though it did show the patterns for Canvas, Drawing Table, PowerPoint, Cricket Draw, GraphicWorks, StandOut!, and Draw it again, Sam. Unfortunately, that contrasting color you chose on-screen for all the applications except for Drawing Table, GraphicWorks, and PowerPoint will not show up in the printed versions.

Printing is not lightning fast, but once you've printed an image from Cricket Draw, everything else seems to take no time at all. I don't mean this as a criticism of Cricket Draw. In fact, it yields the best images and the sharpest colors — but it takes forever to print out an image (I clocked it at five lines per every five minutes). I'd bring along my copy of *Ulysses* or *War and Peace* to read while waiting for the printout. Still want color from your Plus or SE?

SO, IS IT ALL WORTH IT?

Getting color out of your SE or Plus is no easy process. Displaying color on the SE additionally involves some significant expense, though not as much as you'll pay for a Mac II. And the process is worth it if you want to save money and are not too fussy about the small choice of colors and less than letter-quality output, but I wouldn't expect to do color separations or any weird bleeds with this setup.

Even so, if you find yourself salivating over all the blending, dithering, and filling capabilities in FreeHand and other programs that support the color technology of the Mac II, and would like a facsimile thereof, save your pennies and put them toward this machine. For my part, with all the labor it takes to get color on the SE, I'd prefer to break out my Crayolas. At least I can choose from 64 colors, and I get a free sharpener on the box. ■

Directory

Aba Software
P.O. Box 850
Frazer, PA 19355
(215) 644-3580
*Draw it again,
Sam 2.04;* $195

Broderbund Software
17 Paul Drive
San Rafael, CA
94903-2101
(415) 492-3500
Drawing Table; $129.95

Claris Corp.
440 Clyde Ave.
Mountain View,
CA 94043
(415) 962-8946
MacDraw II 1.0; $395

Cricket Software
40 Valley Stream Pkwy.
Malvern, PA 19355
(215) 251-9890
Cricket Draw 1.1; $295
Printer drivers; price not
available at press time

Deneba Software
7855 N.W. 12 St., Suite 202
Miami, FL 33126
(800) 6-CANVAS
Canvas; $299.95

Kroy Inc.
P.O. Box C4300
Scottsdale, AZ 85261
(602) 948-2222
(800) 521-4997
Color Plus; $875
Kolor Processor; $1,295

Letraset USA
40 Eisenhower Drive
Paramus, NJ 07653
(201) 845-6100
StandOut!; $395

Microsoft Corp.
16011 N.E. 36th Way
P.O. Box 97017
Redmond, WA 98073-9717
(206) 882-8808
PowerPoint 2.0; $395

Mindscape
3444 Dundee Road
Northbrook, IL 60062
(800) 221-9884
GraphicWorks 1.0; $149.95

Orchid Technology
45365 N. Port Loop West
Fremont, CA 94538
(415) 683-0300
Colorvue SE; $695

Silicon Beach Software
P.O. Box 261430
San Diego, CA 92126
(619) 695-6956
SuperPaint 1.1; $149.95

SoftStyle
6600 Kalanianaole Highway
Honolulu, HI 96825
(808) 396-6368
Colormate; $75
*Printworks for the
Mac;* $75 to $145

Wing Color Inc.
P.O. Box 56084
Houston, TX 77256-6084
(713) 445-7717
Color Transfer; $49.95

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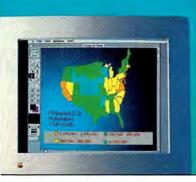
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1. Choose your monitor.

Just as you choose speakers with your ears, you choose your monitor with your eyes. You'll know your monitor when you see it.

So you'll want to look at Apple's color and monochrome monitors, which may well be all the monitor you'll ever need.

But, in case they're not, we offer a few giant alternatives.

Two of them incorporate the renowned Trinitron technology for richest colors, blackest blacks, and the flattest, least distorted image area available.

Just pick between the 19" workstation size, or the 16" executive size—whichever best suits your needs.

Our other two monitors incorporate Ikegami display technology—highly regarded by leading video professionals worldwide.

You'll appreciate the outstanding price-performance of the *SuperMac Standard 19" Monitor.*

Or, if you need a big, photoquality display but don't need color, you'll be very impressed with the *SuperMac 19" Gray Scale Monitor.*

2. Choose a video card.
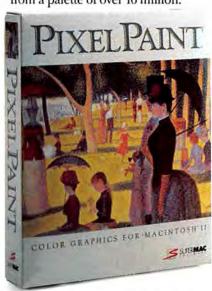
If the Apple 13" display is your choice, our *SuperMac ColorCard* has significant advantages over the Apple card. For starters, you get 8-bit video for up to 256 colors or gray shades, standard. For greatest reliability, the video RAM comes soldered to the board,

not slipped in as an upgrade.
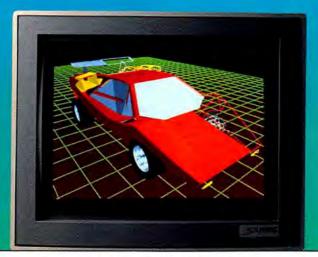
And for a limited time, you get PixelPaint for free.
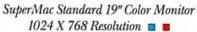
If you *ever* want a bigger display you'll want a *Spectrum card.*

The *SuperMac Spectrum* will drive *all* the monitors shown, at their full resolution. You get 8 bits of resolution standard, for 2, 4, 16, or 256 colors or gray scales simultaneously, chosen from a palette of over 16 million.

■ SuperMac Spectrum Video Card Includes PixelPaint

SuperMac Standard 19" Color Monitor
1024 X 768 Resolution ■ ■

SuperMac 19" Gray Scale Monitor
1024 X 768 Resolution ■ ■

about Mac II video:

And you get PixelPaint, free.

Our *Spectrum/24*, with 24 bits per pixel, provides the most realistic richest color display available. You see the results in the image shown on the *SuperMac Trinitron 19" Color Monitor* above. You can literally display as many colors as there are pixels on the screen, so that images have a photorealism that 256 colors just can't achieve.

Naturally, the *Spectrum/24* is compatible with all standard Mac II software, driving any of the monitors shown above. And it includes PixelPaint.

3. Get PixelPaint. (It's free with SuperMac video cards.)

PixelPaint is the acclaimed color and gray scale paint package that delivers minicomputer paint features and performance, with the ease of use and simplicity of the Macintosh interface.

Whether you're the most sophisticated graphic artist or don't know art at all, PixelPaint and the magnificent Mac II will change your mind about how you work and play.

You'd spend thousands to get this capability on high end systems. At $395 on the Mac II, PixelPaint is a superb value, and a best seller.

PixelPaint is included, free of charge, with our video cards. That's value.

Always: Choose a vendor with great support.

SuperMac video products just plug in and run. The cards actually use digitized voice instructions to talk you through the installation.

All SuperMac video hardware products are protected with a one year warranty.

And, should the need arise, our expert support people will answer your questions over our tech support hotline. Or use our handy 24-hour BBS.

SuperMac ColorCard Includes PixelPaint

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See how easy it is to put together absolutely outstanding Mac II video.

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SuperMac Spectrum/24 Video Card Includes PixelPaint

SUPER**MAC**
T E C H N O L O G Y

Map: Barbara Smyth, using PixelPaint. Tennis Player: Keith Ohlfs, using PixelPaint. Floating Balls: Jim Battson, 24 bit ray tracing. Lamborghini: Markus Houy, using Dimensions.™ The Victorians: Image Studio.™

The Well-Appointed Studio

*If you've ever missed a feature, however whimsical, in
your color painting software, Studio/8 probably has it —
and 50 more you didn't know you needed.*

s more necessarily better? As far as
Studio/8 is concerned, it is. In its
first color paint program for the
Mac, Electronic Arts has man-
aged to pick up on features that, before
Studio/8, you only wished existed in a
paint package. Among the welcome
tool additions is a Bezier tool for draw-
ing smooth, adjustable curves in the
same fashion as in Adobe Illustrator
and Aldus FreeHand (see Figure 1).
Similarly, the Polygon tool can draw
adjustable shapes. But it doesn't stop
there. You can add points to both the
Bezier and polygon outlines, which re-
main fully editable until you set them
in place. The resulting package is a
smoothly working professional art
shop where artists can realize on-
screen what before existed only in their
imaginations.

COLOR IT SMART

Studio/8 does more with colors than
a grenade in a paint store. The pro-
gram excels at helping you use, create,
and manage colors, and takes on much
of the dog work of dealing with the
16.8 million possible colors of the Mac
II.

By design, Studio/8's default pal-
ette uses only 160 of the possible 256

BY SALVATORE PARASCANDOLO AND CARLOS DOMINGO MARTINEZ

JIM LUDTKE

color squares, so you've got all those empty slots to fill. Always available are palettes with 16 grays, 256 grays, and Apple's 256 System colors. Three concentric rectangles in the tool palette display the current foreground, frame (border), and background colors. Clicking on any of these will pop up a color palette from which you can select a new color for that region.

We tend to think of a palette as a selection board. The artist knows that's only half its function. Its other use is as a tool for *mixing* colors. Studio/8 integrates both functions exceptionally well with its Color Square and Color Mixer resources, which allow you to pull color ranges and ad hoc mixes into the working palette for each of your documents (see Figure 2). The Color Square is a 14-x-14-cell matrix of colors that blend into each other. Select a color from a basic subset or from anywhere in the matrix, drag it to one of the square's corners, and the program redraws the matrix with a smooth transition from cell to cell. The Color Square will change color each time you drag. With a few drags, you can create and choose from an endless variety of related colors that you can select to use on the working palette.

The Color Mixer lets you create your own sets of colors to bring into the working palette. You select colors from two scrollable reservoirs and literally mix them in a scratch-pad area by stroking with your brush, blending what's there into new colors. You can also modify any color in the working palette.

Once you use a color you've created in the current document, the color becomes locked on the palette — you cannot remove it. This well-intended protection prevents the inadvertent corruption of your existing image.

If you have several open documents that use different palettes, the program switches to the right one automatically as you switch windows. Cutting and pasting between documents is facilitated by a Paste with Colors option, which transfers the colors of the image you're pasting to the working palette of the receiving document. You can thus paste in selections without the unwanted color shifts that can occur when an image comes under the control of a different palette.

Beyond color, Studio/8 has other smart features like Draft Page, an area on which you can carry out experiments or construct new items without affecting your main document. In one swoop you can paste the main document's content into the draft page, and modify it, with the optional ability to see through to your main document as if the draft page were a clear drawing surface. You can thus easily pre-position new items with no fear of accidents. When you're satisfied, you can choose to discard the draft page, copy
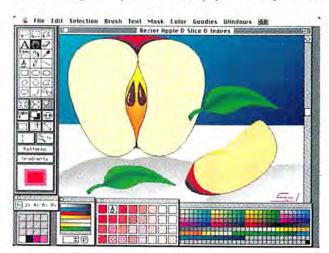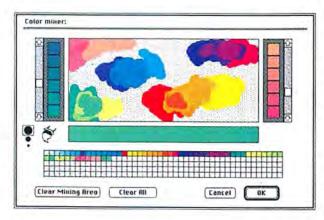
Figure 1: The apple and leaves were all created with Studio/8's beautifully implemented Bezier curves, and the shadows were made from copied, distorted, and refilled parts of the object that apparently casts them. The multitude of tear-off windows can be used or hidden at your convenience.
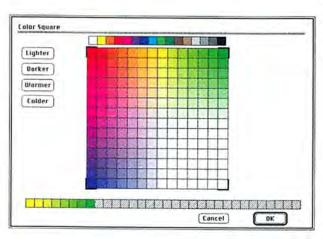
Figure 2: The Color Mixer reproduces a major function of the artist's palette. Dip your brush in the scrolling reservoirs, dab and stroke here and there, and make new colors in the mixing area. New tones appear automatically in the grid below. Those you select can be transferred to your palette. The Color Square develops its own transitional colors based on what four colors you place in its corners. You can select color cells from anywhere in the square and transfer them to the color bar below, and eventually, to your palette.

The Power to C

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76	91	248
CrystalPrint Publisher	*LaserWriter IINTX*	*LaserWriter IINT*

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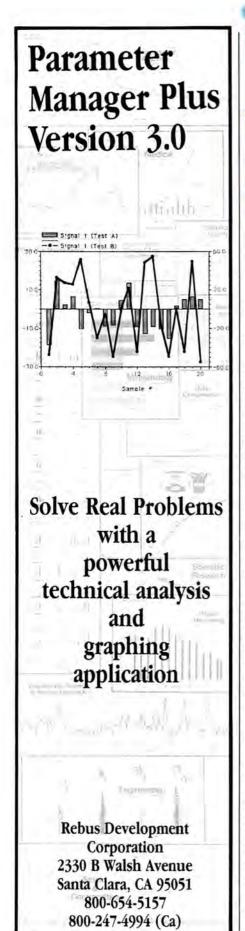
CrystalPrint Publisher . . .
The Power to Choose.

■ The Well-Appointed Studio
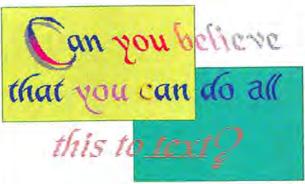
Figure 3: All the text in this block was first typed in fully editable mode, including mixed fonts. After setting it in, various special effects were applied to sections of the text. Later, because all colors except white were masked out, painting on the two background rectangles left the text unscathed and appears to be behind the text.

part of it for later pasting, or merge it with the main document. It's a brilliant implementation.

Text entry is straightforward, with typical styles and alignments available, and Studio/8 lets you freely edit your text as you enter it, including cutting and pasting from within a text block. You can mix different fonts, sizes, styles, and colors in the same box. You can resize and move the box as well, and still keep it active and editable until you click outside of it.

HOME ON THE RANGE

Often you need to depict a particular range of colors or perhaps subtle shadings of one hue. The linear structure of the palette customizer encourages you to organize colors in *ranges,* mini palettes that you create from the Color Mixer or Color Square and bring into the working palette. You can save up to 30 user-defined ranges and import them into other documents. These reside in the program's Preferences file and are available all the time.

Studio/8 can also paint with color gradients, a gradual transition from one color or shade to another. Up to eight separate 32-step gradients may be created and added to a special palette. To make a gradient you select its first and last colors, and Studio/8 fills in the intervening ones. You have the option to use only existing colors as the intermediates or create a brand new and very accurate gradient of in-between colors. Add a color anywhere along an existing gradient, and Studio/8 reworks the new transition to pass through the added tone. If you want a hard band of unblended color within a gradient, you can press the

Option key while dragging the band color into the gradient. You can control the amount of dithering between color steps to produce distinct bands or smoothly blended transitions. Your gradients are accessible from their own palette and may be applied with the Brush, the Paint Bucket, or used as fill for shapes or selections. Studio/8 is aware of the shape you're filling, and does an excellent job of making the gradient look natural for that shape. You can fill ovals and other shapes with off-center radial fills to simulate glints, or you can suggest directional lighting simply by adjusting the direction and distance of the fill.

PH.D. IN FX

A key element of Studio/8's power is its ability to manipulate selections. With its multiplicity of options, Studio/8 is well suited to the production of special effects. Selected areas may be inverted, smoothed, lightened, darkened, tinted, and blended. Selections may be flipped, rotated, distorted, sheared, resized, and bent. Any document (that's in a readable format) can be added to the current painting as a selection.

When you wish to protect an area from paint, you can select it with any of the selection tools and criteria and define it as a mask. You can also protect any number of specific colors by picking them from the palette and dubbing them as masked. In another elegant feature, a mask can be inverted so that it becomes a hole for paint to pass through while the rest of the document is shielded. Masks can even be saved as files, but in this form the masks only remember the shape, not the color(s) of the protected area(s).

By masking certain colors or areas, you can then paint over those objects and have them appear as though you're painting behind them. Confused? Take a peek at Figure 3.

When you ask Studio/8 for transparent objects, all it wants to know is how transparent you want them. With the Pick Up tools any selection can be floated over your painting, and its degree of transparency can be varied with a scroll bar from opaque to clear. You can see the effects as you tinker around, and you can undo the whole thing, of course.

Basically the power is all there. Studio/8 provides the tools and leaves the driving to you. The value of this approach is a degree of flexibility and capability that surpasses any given set of canned effects. But that's not to say the program lacks magic. It's just that you participate in the trick.

YOU WANT SELECTION?

Studio/8 could be accused of giving you too much choice. As easily as you can add color layers (through masking) to an object, you can also select parts to move or remove. A strong feature here is its well-engineered interface for selecting, including, or excluding colors and areas involved in an operation. There are three selection tools to do this: Freehand (lasso-like), Rectangle, and Polygon, each of which can select areas in several modes. You can capture exactly what you've traced out, exclude the background color from the selection (like a good ol' lasso), or exclude ("let slip") *any number* of specified colors from the selection. Moreover, these tools are bidirectional — they normally contract around an area, but they can also expand to seek the edges of a particular color region.

The Slip mode lets you, with the aid of the lasso tool, either include or exclude objects or parts of objects on the basis of color. And this can be more than just one color — it will include any colors you manually select or drag across. You just have to make sure to pass over at least one pixel of the color(s) you want to let slip. These colors can also be manually chosen, added, or subtracted by clicking in any number

Figure 4: This vast, tiled expanse was laid by first setting up the perspective plane by fiddling with its axis controls, and then selecting a patterned area to fill the angled surface of the plane. The floating objects show off Studio/8's talent for creating smart directional fills, tints, and objects of variable transparency.

should definitely make some effort to improve.

A useful brush capability is tracing the edges of a selection. No matter how gnarly the shape, Studio/8 walks the path — a task that done by hand would often be an exercise in disappointment. Custom brushes can be saved separately. Brushes may be transformed into standard selections and manipulated, or even employed as fill patterns.

Predictably, Studio/8's Airbrush comes with controllable pattern size and flow, and paints in whatever color or gradient you've chosen. With gradients, the color doesn't haphazardly change as you brush. Instead, you always spray with the full color range, which matches the transition from the center of the pattern outward, producing effects like glowing puffs and fuzzy pipes and what have you, depending on the settings and colors.

SHARPENING YOUR TOOLS

Studio/8 gives you fine control over the action of all its painting tools. For example, you can set the brush to paint only over regions that are lighter or darker than the current brush color. Even the simple pencil can be configured to restore painted pixels to their original color or to the background color. Some tools, like the Airbrush, are fully customizable and their settings can be named, stored, and accessed from the tool palette. General modifiers, which work with more than one tool, are organized by icons on the palette and can also be invoked with keys from the numeric keypad. Some are simple on/off toggles. Others work together to produce useful variations.

In magnified mode, you normally have one small and one large window on-screen. The Magnify modifier lets you choose which window shows the enlarged view and which one shows the life-size view. The ability to change the size and location of the secondary window is a nice touch. Surprisingly, however, there's no reduced view in which you can work. The Print Preview option shows the whole document, but you can't edit it or reposition the image area relative to the page; and although there's a Select All command, it actu-

of cells in the color palette. The system works exceptionally well and especially simplifies selecting a multicolored item from a multicolored background.

Sorry, there's more. You can simultaneously select multiple *unconnected* areas and treat them as one selection. For example, you can use them as a single brush, refill them, or save them as a separate file. Mercifully, selections are kept active with just the right amount of tenacity, so that you can't easily click somewhere and deselect them. As a last resort, you can simply undo a deselection and watch your lassoed prize shimmer again. Studio/8 has the intensely vital capability to turn your last drawn item into a selection, which lets you move it, resize it,

refill it, or whatever, while leaving the original background intact.

BRUSHING EFFECTIVELY

More than simple paint applicators, Studio/8's brushes are also centers for special effects. Tinting, smearing, lightening, darkening, blending, and watercolor effects are available (tinting is the application of a transparent color over existing colors, to modify, not replace what's there). Modified built-in brushes are saved in the program's preference file. One brush gripe: Depending on the size of the selected brush, a special effect like Blend or Smooth can react significantly slower than one's natural stroking pace. It's an area that Electronic Arts

ally selects only the exact contents of your window, not the whole document. So you can't, for example, lighten, darken, or fill the whole document at once unless you have a large, page-sized screen.

FLYING THE PLANE

A menu selection away from the ordinary world is Studio/8's perspective plane. In a dialog box you can establish vanishing points and the angle and degree of perspective, all by controlling the orientation of a grid. You push buttons for pitch, yaw, roll, and distance, and the animated grid shifts to show the effects of your viewpoint changes as if you're flying over a highly planned city. You can vary the degree of perspective by changing your distance from the plane. It's fast and intuitive, and fun to play with. It even has a real function.

Just as George Carlin explained that a house is simply a place to put your stuff, the perspective plane is just a place for you to fill with copies of anything you select. From the Selection menu, you choose Define Perspective. This gives you a window and tools for torquing and tilting the plane. Once you've defined your perspective, you can go back to your painting window and create an image or tile; when you choose Distort from the Selections menu, Studio/8 will distort and copy it onto the perspective plane. The size of your selection determines the size of each copy. Imagine drawing one tile, selecting it, and having an entire floor laid for you with perfectly joined, repeating copies of your original tile fading into the sunset (see Figure 4). To further help you with perspective there's an Ellipse tool that lets you freely rotate a newly drawn ellipse before gluing it to your canvas, so you can more easily render angled views of circular surfaces.
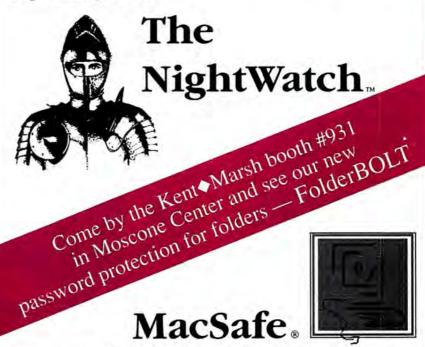
ART DEALING

To its credit, Studio/8 doesn't strand your documents in a proprietary file format. It can write PICT2 (its default format) and TIFF files in both the gray-scale and color variations. In these two standard formats, Studio/8 images are transportable to

■ **The Well-Appointed Studio**

many other applications. Studio/8 can directly open PICT, PICT2, Mac-Paint, and both gray-scale and color TIFF documents. Encapsulated Post-Script Format (EPSF) images, however, must be imported through the Clipboard.

The Open File dialog box has a preview feature that instantly displays a miniature of the image. It's efficient and convenient, but it only works with PICT files.

INPUT/OUTPUT BUSINESS

Color-output devices that accept PICT2 documents, like the Tektronix 4693D and the Mirus FilmPrinter, render Studio/8 files properly. In our tests, we successfully imported a Studio/8 file saved as a 72-dots-per-inch (dpi) color TIFF file into Quark-XPress 2.0, and it printed well. Saved in gray-scale TIFF, the file opened in PageMaker and also printed beautifully. Unfortunately, though it can do so many things with color, Studio/8 doesn't produce color separations. For that you'll have to look elsewhere among stand-alone utilities or import your work into a program that does the job.

A more serious restriction in Studio/8 is that the program uses a Laser-Writer printing technique that renders a relatively small number of gray shades, losing much of the subtlety of the on-screen image and converting eye-pleasing transitions to a few gray bands.

And we experienced intermittent problems when printing to a Laser-Writer, both a Plus and an NTX: A few evenly spaced white hairlines appeared along the places where Studio/8 broke up the image for transmission to the printer.

On some LaserWriters it worked fine; on others it didn't. Using the latest System (6.0.2) and its print drivers didn't help. We were informed that a new, more conventional laser-printing mode is planned and should have been provided to Studio/8 owners by the time you read this. Additional drivers for color PostScript devices are in the works. Hard-copy output from an ImageWriter is also possible, but the generally poor quality (only black-
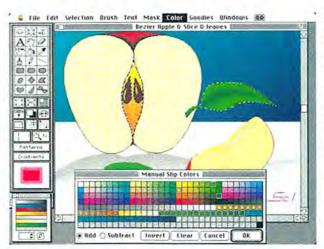
Figure 5: Two areas of the painting have been simultaneously selected with the selection tool in the Expand mode; the slip colors to be included in the selection were simply dragged over with the selection tool. The Manual Slip Colors palette reflects the selected tones. You can add or remove slip colors in this mode, and the selected areas will change dynamically as you do it.
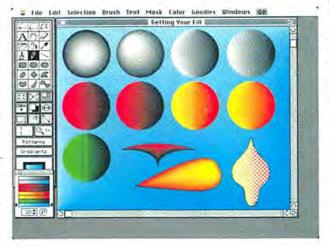
Figure 6: The top row shapes have been gradient-filled in various modes to mimic lighting effects. The middle row shows the difference between banded and dithered fills. The bottom row shows the ability to place an unblended color in a gradient, along with several shape-sensitive fills and a pattern/gradient fill. The background gradient is a slightly dithered range of 32 blues.

and-white) is only marginally useful.

Two utilities are included with the program. ColorCam is a screen-capturing program that creates PICT2 files. Gallery is a "slide-show" manager that can display images in a programmed sequence for on-screen presentations, and offers a choice of transitions and time intervals.

RAM AND ROOM

To house all this magic you'll need a Mac II with a hard disk and a 16- or 256-color capability. Just to install all the Studio/8 files, the manual recommends a minimum of 6 megabytes of free disk space. This leaves about 2 megabytes free for Studio/8 to write its temporary files. You won't necessarily need all the brushes, backgrounds, and large-font files that come with Studio/8, but if you're hanging off the outer edges of your hard disk,

expect to do some serious housekeeping.

Studio/8 also likes to have lots of RAM. Two megabytes is truly the minimum system configuration for full-color work. Less than 2 megabytes may restrict the size of your work area, cut the number of documents you can have open, or limit the scope of some functions. The manual suggests some memory-management techniques, but the cure is more RAM.

You can specify document pixel sizes from 100 x 112 to 1024 x 1024 or "screen size," and you can open multiple documents as memory allows. If memory is short, having an additional open document will reduce the number of possible working windows for all documents.

HIGH-RISE STUDIO

OK, Studio/8 has lots of tools, great

color, and neat effects. All that has got to slow things down, right? You'd expect it to, but it doesn't. Studio/8 does a fairly rapid job, but that doesn't mean you'll never see the wristwatch. The calculation-intensive Fill Perspective Plane operation is a definite cue for a coffee break, but you can't really blame it — it's doing several days' hard work in just minutes.
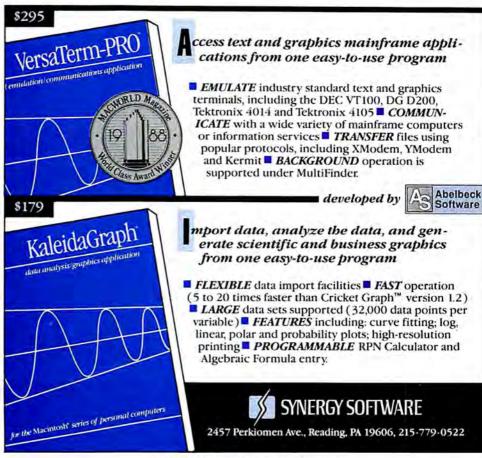
Studio/8's interface is absolutely first-rate and intuitive in design, all which lets you quickly get up to speed. Virtually every function can be addressed with keystrokes. Submenus pop out of the tool box to refine your choice of a tool or modifier, and subpalettes can be torn from the main tool palette and placed anywhere on-screen. The on-line help is highly pictorial, well-worded and complete to a fault. Similarly, the hard-bound user manual is thorough, yet comfortably sized and unintimidating.

By itself, or in MultiFinder with other applications, it painted flawlessly. By the most demanding standards, Studio/8 is an excellent program. Fast, powerful, solid, and smart, it turns a Mac II into an efficient digital artist's studio. All you need are a few lifetimes to explore it all. ▨

CARLOS DOMINGO MARTINEZ IS A MACUSER CONTRIBUTING EDITOR WITH A LIFELONG WEAKNESS FOR PRETTY PICTURES. SALVATORE PARASCANDOLO IS A MACUSER STAFF WRITER WHO CAN BE FOUND MOST EARLY MORNINGS, MOUSE IN HAND, ASLEEP IN THE GLOW OF HIS MAC SCREEN.

MACUSER RATING

Studio/8 ♦♦♦♦½

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ ■ ■ □
On-Screen Help	■ ■ ■ ■ □
Performance	■ ■ ■ ■ ■
Support	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ ■

Comments: A professional-level color paint application. Fast, intuitive, and powerful. **Best Feature:** Tool set, selection powers, and interface. **Worst Feature:** Current print driver. **List Price:** $495. Published by Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404; (415) 571-7171. Requires Mac II with 1 megabyte of memory (2 megabytes recommended) and hard disk. Not copy protected.

"A hard disk for my Mac*?
I've got my Preference.™"

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If you think all Apple* hard disks are created equal, you don't have a Preference. You should.

Preference is our family of performance products for computer users who care. For Apple users, it's the new 20 or 40 megabyte storage solution that's swift, sleek and simply a pleasure to use.
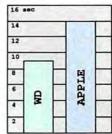
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Which is all the more amazing when you consider that we packed this performance into such a diminutive package — compact enough to sit beside, beneath or even on top of your computer, and tough enough to travel with you.

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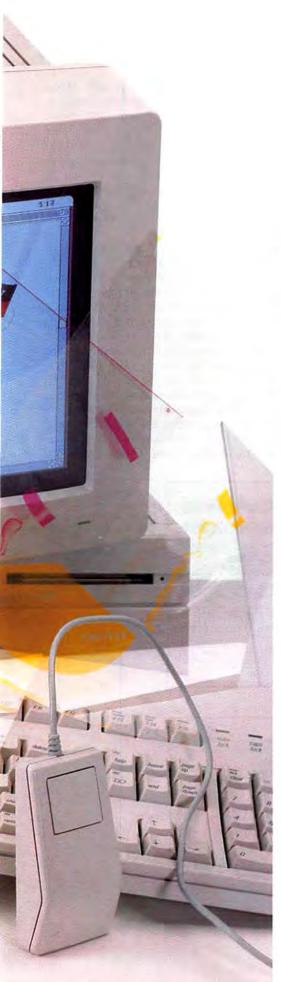
Please circle 123 on reader service card.

BUYER PROFILE
BY PROFESSION

Change of XPression

With color separations, style sheets, and fine-tuned typography, Quark is on the XPress track to success.

As the desktop-publishing market matures and competition increases, existing products face an uphill battle to attract and maintain users. One program in the Macintosh world with a steady growth curve is QuarkXPress. Desktop publishers — from major newspapers, magazines, and book publishers to communication departments and advertising agencies — are increasingly choosing it over PageMaker and Ready,Set,Go!.

With the release of QuarkXPress 2.0, Quark further establishes XPress as the most professional page-layout package for the Macintosh. (The program, formerly XPress, was renamed QuarkXPress for the new version. We will use XPress to refer to features common to all versions, and QuarkXPress for features unique to 2.0.)

QuarkXPress offers significant enhancements, including 24-bit color, style sheets, and improvements in the program interface. Experienced users

BY DIANE BURNS AND S.VENIT

should have no trouble mastering the new features, as they have been implemented in a way that is intuitive and consistent with the way the program works.

FIRST XPRESSIONS

The features that have always distinguished XPress from its competitors — especially PageMaker 3.0 — remain in QuarkXPress 2.0. XPress was one of the first page-layout programs to offer text runaround, in which text flows around the outline of a graphic. Naturally, this feature is retained in version 2.0; unfortunately, a single column of text still won't flow around both sides of a graphic.

But the program's major distinguishing feature is its box, or frame, orientation, which means all page elements exist in either a text box or a picture (graphics) box. This setup may be intimidating to new users, but the precision and control it allows are essential to professional document production. With text and graphics in discrete boxes, you can enter numerical specifications to within thousandths of an inch for the exact size and location of a box on the page. You can, of course, also move and size boxes visually, just as you move objects in Page-Maker. Both text and graphics boxes can contain other boxes, and these *children* remain with their *parent box* when it is moved, greatly simplifying many layout tasks.

The box structure also makes it easy to link boxes so that text flows to any other box on any other page of a file. This feature is invaluable for applications such as magazine production, in which a story frequently starts on one page and jumps to another. Not only does XPress let you link text to flow automatically from, say, page 1 to page 8, but it also lets you enter page numbers for the next page and the previous page. Thus, you can set up "Continued on page . . ." and "Continued from page . . ." text that will automatically show the correct page number of the linked box.

XPRESS YOURSELF
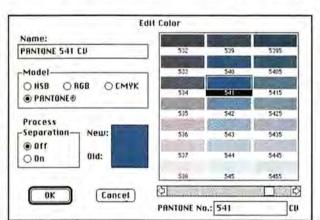
You can have up to seven documents open at once with QuarkXPress

2.0, which requires 1 megabyte of RAM and a hard disk. The 755K program maintains its RAM requirements by using virtual memory swapping; that is, it transfers data between RAM and the hard disk to avoid memory overloads. This means the number of pages per document is limited only by the free space on your hard disk.

XPress's Preferences box lets you set defaults for such things as the measurement system, page insertion, leading, and kerning. There are seven measurement choices, including Inches Decimal and Ciceros (for you French typesetters). You can choose between Fractional or Integral character widths, and between Word Processing and Typesetting for the default leading mode. You can even decide the point size below which text will be greeked (shown as gray bars), which makes the screen redraw faster.
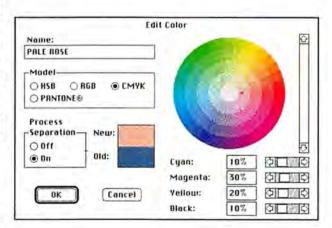
XPress has an interesting variation on the standard Duplicate command that lets you create forms and other

repetitive documents quickly. Using the Step and Repeat command, you can specify the number of duplicates of a text or graphics box, as well as the duplicates' horizontal and vertical placement relative to the original. Each duplicate box has the contents of the original. This command will not place duplicates outside the original page, however, and it won't work with linked boxes.

Any box can have a border, or frame, which is an integral part of the box and does not have to be created separately. XPress provides several predesigned, mathematically defined frames that can be resized but not edited. A separate Frame Editor program lets you modify predefined bit-mapped frames, or create your own. Bit-mapped frames can only be used on rectangular boxes, however.

The documentation, which consists of two manuals, has evolved with the program. Early versions were downright skimpy; the QuarkXPress 2.0

QuarkXPress 2.0 lets you choose colors from the Pantone matching system (top), or create your own process color by entering percentages of cyan, magenta, yellow, and black.

manuals have been fleshed out to provide better explanations and a good tutorial. Additional background and examples are provided in several areas, including contrast curves, line screens, color separations, typography, and design. Our only complaint is that there are too few entries in the index.

XPERT TYPOGRAPHY

XPress has always offered much more typographic control than Page-Maker. For example, XPress can kern (adjust the space between) letter pairs in increments of 1/200 of an em space, whereas PageMaker 3.0 can kern only 1/48 of an em space at a time. XPress lets you use fractional point sizes, such as 10.5 points; PageMaker 3.0 does not.

XPress also has more PostScript-supported manipulation of fonts. You can scale type horizontally, thus producing condensed or expanded fonts of any typeface, and you can screen type in color or various shades of gray.

Text files from several word processors can be imported, including those from Word, WordPerfect, WriteNow, MacWrite, and Microsoft Works. Basic formatting (bold, italic, and font size) is retained, although complete style sheets can only be brought in from Word files. XPress contains filters for exporting formatted documents back to Word, WriteNow, and MacWrite.

QuarkXPress has some of the best word-processing capabilities of any page-layout package, including a search and replace feature, a spelling checker, and the ability to show or hide invisible characters such as spaces, tabs, and carriage returns. Like Microsoft Word, XPress allows you to search for and replace even invisible characters.

XPress's hyphenation control lets you specify hyphenation conditions such as the number of letters in the smallest word that can be hyphenated, the minimum number of characters within a word after which a hyphen may appear, and the number of hyphens in a row that may occur.

In the graphics arena, XPress lets you import numerous formats: PICT, PICT2, Encapsulated PostScript For-

TYPETALK

SERIFS MAY BE OUT IN 1990

FUN

IN THIS ISSUE

2

3

5

7

8

This is a sample tabloid page produced in QuarkXPress 2.0. The body copy is New Century Schoolbook, which has been condensed inside QuarkXPress. The graphic ("Fun Type") was imported from Illustrator 88 and will be treated as a four-color separation on output. The headline for the lead story and the colored box behind "In This Issue" have been specified as a Pantone matching system color and will be separated as a spot color.

mat (EPSF), color and gray-scale TIFF, black-and-white TIFF line art, gray-scale RIFF, and color and black-and-white bit maps. A Style menu lets you make changes to all of these formats except PICT, PICT2, and EPSF. You can color artwork, adjust contrast and color saturation, posterize an image, make a negative image, or apply screens at various angles. The contrast and screen controls, in particular, are extensive and can be customized.

COLORFUL XPRESSIONS

Version 1.1 of XPress offered eight colors, and you could print separations for spot color. QuarkXPress 2.0 makes a quantum leap in desktop color on the Mac. It supports 24-bit color, giving you access to 16.8 million colors on the Mac II. QuarkXPress can produce four-color process separations, and it provides access to the entire Pantone color matching system. PageMaker 3.0, by contrast, can only do spot color

separations and does not use Pantone colors. (For more information on spot and process color, see "Over the Rainbow" in this issue's DTP section.)

You can produce color separations of text and objects created within the program, including black-and-white TIFF pictures colored by Quark-XPress. You can select colors using Apple's Color Picker, or create process colors by indicating percentages of cyan, magenta, yellow, and black (CMYK), the system used by most offset printers for color separations. You can also specify color using the red, green, blue (RGB) or hue, saturation, brightness (HSB) systems. If you have a color monitor, as you specify or change percentages of color, a color swatch in the dialog box changes as well. If you specify a Pantone color, you can choose whether you want it to be treated as a spot color or four-color separation.

Color can be applied to text or graphics. The outside line of a box or oval can be a different color from its background or contents, which can be useful for producing separations of certain designs. If, for example, you have a cover page that has a blue box with a black frame around it, Quark-XPress can automatically separate the two.

To accomplish the same separation in PageMaker, you would have to create and position the black line around the box as a separate item, because PageMaker won't let you assign separate colors to the outline and fill of a single object.

The only imported color graphics that QuarkXPress can separate are those from Adobe Illustrator 88. Quark says this is because (oddly enough) Illustrator 88 is the only program to use Adobe's implementation of Color PostScript. However, while QuarkXPress can separate process colors applied in Illustrator 88, it cannot separate Pantone colors selected in Illustrator 88. In addition, Illustrator 88 files will not appear in color on screen, because the Encapsulated PostScript files generated by Illustrator 88 don't contain a color screen image.

QuarkXPress 2.0, like XPress ver-

sion 1.1, can import color scanned images like photographs and display them on-screen. This includes 24-bit color TIFF images from newer programs like Avalon's PhotoMac and the CyberChrome 36A Desktop Color Prepress System. You can change the contrast for each color individually, posterize the image, or make a negative of it. Although QuarkXPress cannot perform color separations of these images, the image can nonetheless be extremely useful in preparing color composites of pages, which can be printed on the QMS ColorScript 100 printer.
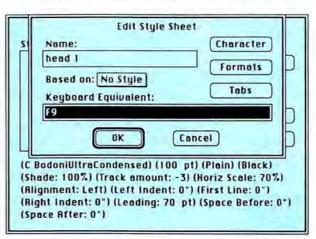
XPRESSIVE STYLE

Style sheets are completely new in QuarkXPress 2.0. They are basically implemented the same way as style sheets for PageMaker 3.0 and Microsoft Word 3.0x. That is, from the Define Styles dialog box, you can access most of the formatting commands available for character or paragraph formatting, including setting tabs.

Once a style is defined, you simply apply it to the appropriate text. Quark-XPress also reads in style sheets from Microsoft Word.

Applying styles to text is made extremely easy by a feature that lets you assign a keyboard equivalent for each style. With an extended keyboard, you could assign a style to a function key, then simply click in a paragraph and press that one key to apply the style. Styles can also be attached to the numeric keypad keys of a standard keyboard. Using a keyboard equivalent in QuarkXPress is much faster than applying styles in Microsoft Word, which requires that you type a three-key sequence plus the style name. PageMaker actually forces you to use the mouse to apply styles, which we find less efficient than keyboard strokes.

Style sheets are tricky, and just as PageMaker 3.0's implementation was not perfect in the first release, Quark-XPress's style sheets had some minor problems. For example, when defining

Style sheets are new to QuarkXPress 2.0. The Edit Styles dialog box lets you define the character, paragraph, and tab formatting. You can even assign a keyboard equivalent for each style, making the styles extremely easy to apply.
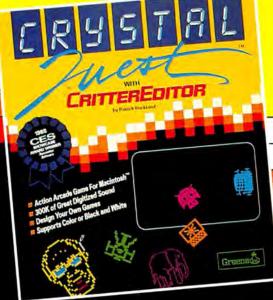
In QuarkXPress 2.0, you can search for and replace individual font attributes such as typeface, size, and style. To reach this dialog box, turn off Ignore Attributes in the main Find/Replace dialog.

a hanging indent as part of the format for a style sheet, we no longer had access to the left indent marker on the tab ruler. If we used the paragraph Formats option, the hanging indent did not hold.

FACIAL XPRESSIONS

QuarkXPress 2.0 sports several improvements to its interface and basic operation. In XPress version 1.1, for example, moving a box from one page to another was a multiple-step process. QuarkXPress 2.0 lets you simply copy and then paste a box to another page or file. You cannot, however, drag a box from one page to another, even if both pages are visible on the screen. This is convenient in PageMaker but not feasible for a program like QuarkXPress, which needs to know where everything is in order to support advanced features like automatic page numbering for "Continued on page . . ." lines.

XPress 1.1 did not use hierarchical menus, and by using them, QuarkXPress 2.0 has two fewer menus than version 1.1. The Font and Paragraph menus of version 1.1 have been incorporated into the Style menu of version 2.0. Leading control is still in a dialog box separate from character formatting, which we find inconvenient. However, QuarkXPress does offer baseline-to-baseline leading, the most conventional method of measuring leading. PageMaker, surprisingly, does not offer this method of computing leading.

One of XPress' most powerful features is its ability to search for and replace font attributes. You could, for example, search for every occurrence of Times 12-point bold and change it to Helvetica oblique. This differs from a style sheet, which makes quick changes at the paragraph level, because it can operate on individual characters within a paragraph. In QuarkXPress 2.0, Change Attribute is combined in the same dialog box with Find/Change text.

XPRESS RATED

QuarkXPress 2.0 is a powerful program. There's a trade-off in its box-oriented design: While more control is possible than with a non-box-oriented

program like PageMaker, the latter is more intuitive to learn and use. In PageMaker, you manipulate type and graphics directly, without having to keep characteristics of the box itself in mind. For example, one of the most common complaints about XPress is about the whole notion of parent-child boxes. You cannot, for example, simply draw a line where you want it; it has to be within the parent box. In PageMaker, you can draw a line anywhere with no restrictions.

For basic desktop publishing, especially by nonprofessionals, QuarkXPress 2.0 may not be the best package to use. Even Quark recognizes this, as demonstrated by the recent release of QuarkStyle, a template package combined with word processing that automates the production of everyday business documents like memos and reports.

As PageMaker and QuarkXPress continue to play leapfrog, the market as a whole benefits from each product's improved features, higher-end capabilities, and increased reliability. 🖼️

DIANE BURNS AND S. VENIT ARE FOUNDERS OF TECHART INC., A DESKTOP PUBLISHING DESIGN AND PRODUCTION FIRM IN SAN FRANCISCO. THEY HAVE COAUTHORED SEVERAL BOOKS ON DESKTOP PUBLISHING.

MACUSER RATING

QuarkXPress 2.0 ⚡⚡⚡⚡½

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ ■ ■ □
On-Screen Help	■ ■ ■ □ □
Performance	■ ■ ■ ■ □
Support	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ ▣

Comments: Currently the most powerful page-layout program available for the Macintosh. **Best Features:** Four-color separations, search and replace of text attributes (font, style, and size of individual characters). **Worst Feature:** Constraint of child boxes within parent boxes. **List Price:** $795. Requires 1 megabyte RAM and a hard disk. Mac II required to view color features. MultiFinder friendly. Copy-protected until warranty card is exchanged for personalized version of program. Published by Quark Inc., 1983 Landings Drive, Mountain View, CA 94043; (415) 967-6796.

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THE HELP FOLDER

BY CHRIS ESPINOSA

Got a Mac problem? Something you'd like explained? Something you can't find the answer for anywhere else? Apple's Chris Espinosa will answer your questions every month in this space. When the questions are too tough or too esoteric for him, he'll get the answers from other members of the Mac team. So ask what you need to know and get your answers straight from the source!

Send your questions to Chris c/o MacUser, 950 Tower Lane, 18th floor, Foster City, CA 94404. Chris will read all of your questions, but, unfortunately, he may not be able to answer individual queries.

HAPPY BIRTHDAY TO MAC

The Macintosh is five years old this month, so this edition of the Help Folder is a little different. I'm taking this opportunity to answer the questions I've always wished someone had asked but didn't. I'm also throwing in some of my favorite questions from other people.

Next month, as we go into the Macintosh's next five years, we'll go back to the regular program of your letters and my answers.

WINDOWS AND THE FINDER

Q. What's the difference between a Finder and a window?

A. That's my favorite question of all. It was asked at a Macworld Expo conference session in 1986, and though half the audience started to titter, it's not a dumb question. It's the kind of question you ask when you're new to the Mac and not all the words make sense yet.

One of the problems in creating the Macintosh was picking the names for things, and *Finder* was one of the hardest. We used metaphoric names for lots of things — we used *window* because you look through it, *desktop* because it's what you do your work on, and *mouse* because it looks like one (well, less so when it was beige, more so now that it's gray).

Those weren't the only names we tried. For a little while we were calling windows *viewers* and applications *skills*, because we thought those two words worked better together. But it's funny — the power of the individual word was much more important than how the words worked together. So now the Macintosh interface is full of mixed metaphors. When was the last time you put your trash can on top of your desk or closed a window with a mouse, for example? Because of the mixed metaphors, the words can be confusing.

The advantage of a graphics user interface is that it allows you to remember things by what they do and look like, not by what their names are. So most people can work productively even if they don't know the difference between a window and a Finder.

Oh, right — windows are for looking inside of files or documents to create or change them, and the Finder is for working with the outside of files or documents, to file them, copy them, or throw them in the Trash.

THE COMMAND KEY SYMBOL

Q. What does the funny symbol on the Command key mean? And why is there an Apple symbol next to it on the new keyboards?

A. On the Apple III way back in 1980, we put two Apple keys on the keyboard for programs to use as they wished. We put an Apple key on the Apple IIe's keyboard when we introduced it in 1983. In 1983 the Command key on the Lisa keyboard also had the Apple symbol on it.

The Macintosh was going to use the same symbol and have the Apple symbol in the menu for the Command-key equivalent, just like the Lisa. But late in 1983, somebody (I bet you can guess who) decided that using the Apple symbol on keys and in menus was "corrupting the logo" — sort of like those rare Britons who don't lick postage stamps because they don't approve of spitting on the back of the Queen's head. So we had to change the keyboard and the software and the documentation all in a very short period.

But first we had to come up with a good Command-key symbol. The requirements were pretty heavy: It had to be small, recognizable, unique, and easily rendered in a simple font character (for the menu), and it had to mean "command." The International Standards Organization (ISO) book of symbols offered little help (its recommendations for the Shift and Option keys can be seen on Apple's non-American keyboards).

Finally Susan Kare and Barbara Koalkin found the symbol that's now known affectionately by many names: flower, propeller, freeway, splat, command, feature, and cloverleaf [*Don't forget butterfly. — Ed.*]. It came from a book of Swedish campground trail markers and means "remarkable feature!"

The Apple symbol came back with the introduction of the ADB (Apple Desktop Bus). Now that Apple keyboards are interchangeable among many Apple computers, that key has to do double duty: It's the Command key on the Macintosh

family and the Apple key on the Apple IIGS.

WHY SO MANY KEYS?

Q. What are the Home, End, Page Up, and Page Down keys on the Extended Keyboard supposed to do? I can never get them to work.

A. As I mentioned before, with the introduction of the Apple IIGS, we introduced a new method of connecting keyboards and mice to Apple computers, called ADB (Apple Desktop Bus). The glorious plan was to have one Apple keyboard for all computers because the then-upcoming Macintosh SE

and Macintosh II also used ADB keyboards.

The problem was that the Apple IIGS keyboard, while aesthetically pleasing for the GS, looked . . . ahem . . . a little . . . well, . . . silly in front of the much larger Macintosh II. The only other keyboard planned was one with 104 keys in the same layout as the IBM PS/2 keyboards. It was so big that its project name was *Saratoga*, after the aircraft carrier. It was a special-purpose keyboard intended only for use with MS-DOS emulator cards, UNIX, and other keyboard-intensive — not Mac-like — uses of the Macintosh II.

So a compromise was

reached: We took the key caps and generally larger design of the Saratoga keyboard and the more compact layout of the GS keyboard, and we created the Apple keyboard, which was supposed to be the standard keyboard for both the Mac SE and the Mac II.

It seems, though, that more people are buying the Extended Keyboard, the one intended for MS-DOS and UNIX users! In fact, I prefer it, mostly for the separate cursor keypad. As people realize it's the more popular keyboard, more applications take advantage of the extra keys, especially the 15 function keys along the top. HyperCard lets you

execute a message handler in response to the `on functionKey` message. And MacroMaker, Quic-Keys, and Tempo II all let you replay saved mouse and keyboard sequences when you press a function key. Some applications even use the Help key to bring up their help systems.

But Home, Page Up, Page Down, Del, and End will probably be perpetual orphans in the Mac world. Since they're not on every keyboard, applications can't rely on them to implement necessary features.

I'll leave you in suspense (until next month) on two last mysteries: Why "Macintosh" and who was Lisa?

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HARDWARE

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World Processing

Want to change the world? Don't bother — with Super 3D, you can build your own.

L ife on the Mac desktop is a parade in two spatial dimensions. Alas, the real world has three. Depicting that third dimension in a graphics package is an alluring — but elusive — goal. A good 3-D graphics program must support a respectable level of precision and allow complex shapes to be created with minimal steps. It should permit existing objects to be easily placed, repositioned, edited, and combined. It must be responsive, its interface must be simple and intuitive, and it should actually invite experimentation. It must, above all, correctly render the 3-D world. The long-awaited Super 3D, from Silicon Beach Software, makes great strides in many of these areas, and baby-steps in others. It's definitely out to lure the shy and the doubting out from behind their two-dimensional wall.

WHAT, ME 3-D?

Many computer-aided design packages have 3-D modes, replete with a rigorous technical interface. They're also priced well into the fourth dimension. There's also the crop (and it would scarcely fill a flower pot) of dedicated 3-D software, which is more accessibly priced, but which hasn't yet sparked a mass-purchasing attack.

Engineers and architects already know what 3-D software can do for them. What does anyone else need it for? If you're an artist who simply needs a 3-D *look,* you just could draw the old fashioned way, in two dimensions (2-D), then deftly add perspective and lighting effects, and voilà: 3-D. But that comfortable and trusty 2-D application will require hours of painstakingly scratched out multiple views, time-consuming object arrangements, and complex and difficult-to-edit shadings — it's enough to drive you positively 2-D-fruity. And it might be enough to sell you on the benefits of a good 3-D application, even if you don't use it every day.

3-D OR NOT 3-D

Super 3D is a *surface-framing* tool, as opposed to a *solid-modeling* tool. With solid modeling, you hack away at a lump of matter by tracing out the shape of one or more cross sections and
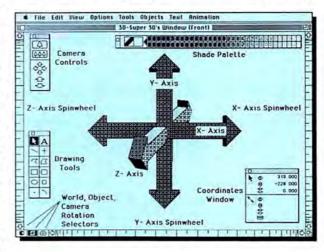
BY SALVATORE PARASCANDOLO

side or top views. To edit such solids, you can modify the outlines of one or more views, or in some cases, add or subtract other lumps of matter from them. In surface modeling, you construct the outsides of things, covering empty space with an infinitesimally thin substance. To change the shape of an object, you select one or more points, edges, or facets and move them.

One of the best things about Super 3D is that it integrates 2-D and 3-D creation, full-blown editing, and viewing all in one mode and one window. Part of what cramps the creative process in some programs is their use of restrictive modes that force you to make elaborate preparations, change views, and practically file a written application before you can do something. Super 3D's refreshing "anytime, anywhere" interface makes modeling exceptionally easy. Frequently used commands are topmost in the menus for quick clicking, and they have generously assigned key equivalents. Objects can be manipulated with the mouse or with precise numerical specifications. At any time you have the option of rotating a selected object, orbiting the world, or looking in any direction from a central point. Tools reside in floating windows that are handy for both small and large monitors. On a small monitor you can see more of your work by moving or closing any tool window. On a large monitor, you can park the necessary windows next to your work area.

Super 3D lets you achieve precision to 1/1,000 of a pixel because you can create, move, or edit objects using numeric inputs whose decimal accuracy you can set from 0 to 7 places. You can assign a shade to the background or import a background image from the clipboard. While the background cannot be freely manipulated, it can be centered in the 3-D space, scaled to the current window, or have its upper-left corner flush with the upper-left corner of the window. Imported backgrounds can be used for decoration, clarification, or as tracing templates to guide the shaping of 3-D objects.

You can type (and later edit) text in the 3-D world and shade its background, but text isn't treated as a 3-D object. It can be freely moved in the confines of your window, but it can't be rotated or given depth. In any view, text always faces you exactly as it was originally typed. Standard styles and alignments, plus extended and condensed type, are available. A simple grid of 50-x-50-pixel squares is provided for visual alignment only. You can show or hide it by key or menu, but there is no snap-to-grid option.
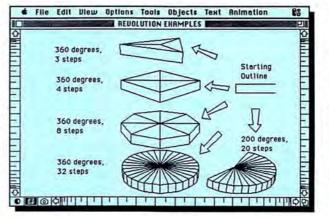
SHIP OF TOOLS

The user interface for a 3-D program makes the difference between dreams and nightmares when you're trying to carve out a niche — or a chair, an aircraft, or a widget. Super 3D gets a lot of mileage out of just a few basic tools and operations, starting with the transition from 2-D to 3-D.

To create 3-D objects with Super 3D, you first draw an outline with a

The basic tools and controls for Super 3D are the drawing tools and shade palettes, the camera controls, the coordinates window, the point-of-view selectors, and the three spinwheels. (The axis guide in the center is a drawing, not one of Super 3D's tools.)

You say you want a revolution? You can control the number of facets on a revolved shape. Specify less than 360 degrees and you get partial disks and cutaway views. So revolving a rectangle 360 degrees in four steps produces a four-sided solid, 360 degrees in 32 steps renders a disk, and 200 degrees in 20 steps yields a section of a pie chart.

Terms of 3-Dearment

To become a 3-D-ologist, you'll have to add another dimension to your graphics vocabulary. The world has three *axes*: *x*, which runs side-to-side; *y*, which runs up and down; and *z*, which runs in and out of the screen. A *vertex* is a corner point, where two or more lines meet. An *edge* is the line between two vertices. A *face* is a facet of a solid's surface. *Translation* means moving along one or more axes. *Panning* means pivoting the observer's view, or camera, looking side to side or up and down. *Dollying* means moving the camera side to side along the x-axis, up and down along the y-axis, or in and out along the z-axis. *Zooming in* means magnifying the current view by using a more powerful, telescopic lens. *Zooming out* means reducing the view by using a weaker, wide-angle lens. That's it for 3-D 101; you're now certifiably 3-D-mented.

combination of tools that will look familiar to those who use MacDraw, SuperPaint, or similar object-oriented applications: lines, polylines, polygons, rectangles, round-corner rectangles, ovals, circles, and arcs, and a special dimensionless point tool. The point tool can be used as a dot in 3-D space, as in a graph, or it can be tooled to form a complex line. The next step is to thrust your 2-D outline into the third dimension by revolving it, extruding it, connecting two or more cross-sections, or sweeping it through space with a combination of rotation, translation, and resizing along the three axes.

With the Revolve tool, you can spin a profile constructed along the x, y, or z axis, on a "lathe" to form a solid. You can specify how many degrees to revolve and how many facets there should be along the perimeter to produce either smooth or coarse shapes. The Extrude tool gives depth to an outline. (For those of you familiar with the programs available from Enabling Technologies, this is roughly equivalent to the Jigsaw tool in Easy3D or to a simple use of the Profiler in Pro3D.) You can specify the direction of the extrusion and can further specify how many subdivisions or slices the solid should have.
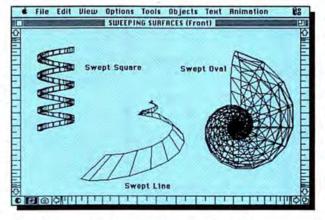
Connect Cross-Sections might remind you of laying out the ribs of a ship's hull, and having Super 3D apply the outer skin. Start by creating the cross-sections with any of the drawing tools. Your ribs (well, not actually *your* ribs) can be outlines of any shape as long as they each have the same number of points. Then select the ribs in the order you want them joined, choose Connect Cross Sections, and a slow voilà later, you have a solid model. When you're knee-deep in ribs, Super 3D's multiple view feature really helps to align, resize, and reshape each section.

The power tool extrordinaire of Super 3D is Sweep Surface. It almost defies textual description — you need gestures to fully convey the concept, but here goes: It's an enhanced combination of the Connect Cross Sections and Replicate tools. (Replication is discussed later.) Start with a 2-D outline. Then, by supplying rotation and

Extrude! Extrude! Read all about it! You can add depth to just about any 2-D outline.

Both of these gears were rendered from the same eight-tooth gear outline. The straight gear is a simple extrusion of the outline. The beveled helical gear was done by sweeping the outline and specifying a reduction along x- and y-axes, and a rotation along the z-axis.
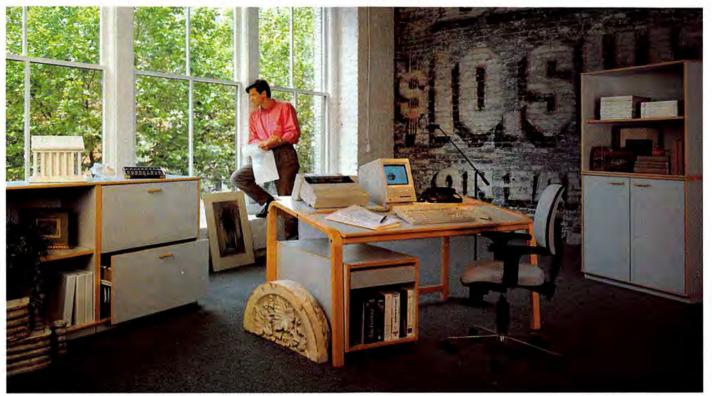
These are wire-frame views showing various sweeping options. The swept square was revolved around the y-axis, as well as translated along that axis, giving it both orbital and upward sweeping. The line was swept and translated along the y-axis, and also reduced in size with each step. The oval was swept along the z-axis and reduced along x, y, and z.

translation (displacement) values along each axis, you specify how the outline should be swept through space, with x, y, and z resizing factors for each step. Finally, specify how many times the effect is to be repeated. After a well-earned OK, Super 3D creates a solid by connecting the cross-sections of the progressively mutated outline. The quantity and complexity of objects and transformations is limited only by your available RAM and your

disk capacity. If you need beveled helical gears, threaded screws, springs, ram's horns, and stuff you'd never find on this side of the *Twilight Zone,* this is your tool.

After the transformation from 2-D to 3-D, you'll have a three-dimensional object composed of connected facets, or polygons. You'll probably want to reorient your object, copy it, shade it, add parts, and so on. This is where another set of tools comes in.

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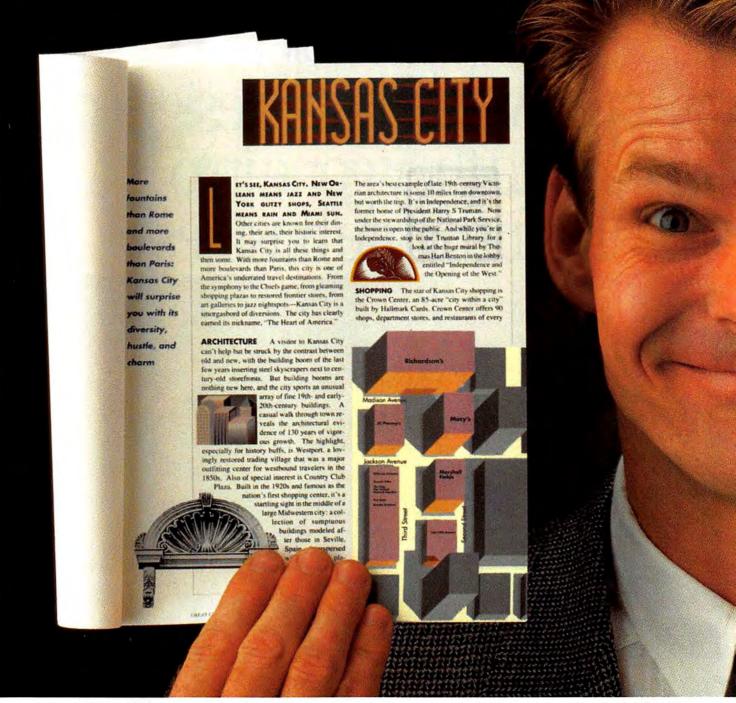
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REASONABLE FACSIMILES

You've just rendered a 3-D building with 50 windows, each divided into four panes. Then your client asks to see the same design but with windows that have two panes, a thicker ledge, and tinted glass. You *could* change each window, or modify only one, then carefully replace each old window with a copy of the new one, but that's still a lot of work.
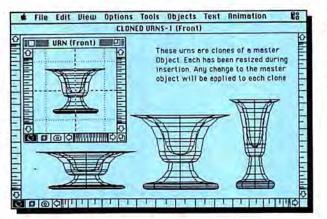
Well, cheer up. With Super 3D you can construct an item, in 2-D or 3-D, name it, and dub it a master object that can then be cloned any number of times. Before inserting a copy of the object into the 3-D world, you can specify its precise placement coordinates, rotation, and resizing factors along each axis.

Master objects are not mere duplication templates; their clones retain a connection to the master, sort of like style sheets in a word-processing document. If a master is subsequently changed, its clones in the same document will change automatically, but they'll retain their current relative size, position, and rotation. Clones are protected from reshaping changes. You can resize, translate, and rotate clones, but you can't ungroup them or edit any of their individual components — a clone must always match the fundamental structure of its master object.
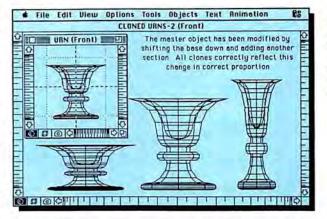
Unfortunately, these wonder objects are a bit too protected: They can't be grouped. With an item forever ungrouped, it's easy to overlook an unselected item when you make what you intended to be global changes within an assembly.

You can, however, convert your entire assembly into a master object that will be automatically grouped when in use. Another limitation, for 2-D master objects, is that none of the good stuff — the Revolve, Extrude, Sweep, and Connect tools — can be used to transform 2-D master outlines into 3-D solids.

These limitations aside, cloning objects gives you incredible leverage, far beyond the obvious benefits of multiplying a small change into many. You can choose to hide or show all the clones of a specific object. This simple

Behold these clones. Each urn was inserted and squashed or stretched. The master object remains as originally drawn.

Without a lick of work, each clone follows the changes of its master object. The same would be true if the master were rotated, translated, or resized.

toggle can temporarily remove slow-to-render complex items, unclutter your 3-D workspace for better visibility, or draw the layers of a more complex structure as separate objects so that you can manage them easily.

You can leverage this leverage even further by creating new master objects constructed partly or totally from other master objects. Your large assemblies can be composed of all sizes of subassemblies and individual parts. As master objects, these parts can be edited in an uncluttered environment, unzoomed, but in a workable size, and without the overhead of screen-redraws that include items you don't care to see.

Objects composed of other objects simplify animation (see the sidebar "An Animated Discussion"). You can easily animate many clones (like gears, shafts, fingers, eyeballs) by making changes to a single master object. You can subtly reposition a finger of a hand, regardless of where the hand is in 3-D space, how it's angled, or how small it is. You work with the master

object, in full size. Super 3D knows what's connected to what, and how every object in the hierarchy is angled — the upper arm, the elbow, the wrist, the palm, and so on. This feature is casually explained in the manual, but it's cosmic-grade power.

Each document owns its master objects. To use another document's objects, you must use the Merge command, which places another document's objects into your current document and lists them in your Objects menu. Once merged, the imported objects become masters whose only affiliation is with your current document; their link to the *original* masters is broken, so any changes you subsequently make to them won't affect any other documents.

Super 3D provides yet another clone-like shortcut: You can select any item or group of items that you've created and save it as a Shape file. You can import shape files into your other drawings by selecting Insert Shape from the File menu. Unlike a copy of a master object, a shape maintains no

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link to its master, and can thus be ungrouped and freely edited as if drawn from scratch. Both master objects and editable shapes have their flexibilities and limitations. With some forethought, you can combine their strengths and tackle projects of great apparent complexity.

Another cloning relative, the Replicate command, makes copies of an original 2-D or 3-D object a specified number of times and can progressively resize, translate, and rotate, each copy. This can save heaps and heaps of work. Imagine hand-installing 128 turbine blades precisely around the perimeter of a shaft, manually tracing the shape of a 30-tooth gear, or painfully dragging into place the steps of a spiral staircase — it's all cake with Replicate.

Two other tools simplify construction and editing by taking over some of the picky little chores that would otherwise drive you nuts: Seal Vertices and Snap To Vertices.

Seal Vertices looks at all the vertices in a set of grouped objects and moves two adjacent vertices to a point halfway between them. Averaging all vertices, of course, would turn every object into a single point, so you limit the averaging process by specifying the maximum distance between vertices that can be joined. If that distance is half an inch, every vertex less than half an inch away from another will be averaged with it. This feature is useful for seamlessly joining two objects whose adjacent faces don't quite match up, or to create a smooth transition between two objects of different sizes or even different shapes.

Snap To Vertices is a drawing option that helps to draw gap-free objects composed of multiple parts. When new parts are drawn very close to existing ones, their respective closest vertices are overlapped, appearing as one. The vertices aren't merged, however.

EDDDITING
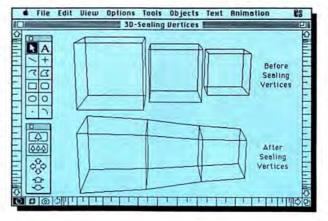
Once you're done creating, you have a host of editing options available to you. There are the usual selection, grouping, resizing, distortion, and scaling tools you'd expect, as well as a few others you might not.

You can rotate objects, orbit the 3-D world, or look around from where you're floating by using x, y, and z *spinwheels.* These are analogous to scroll bars, except they spin things around — either the world, an object, or your point of view, depending on which tool is active.

There's also a quick z-axis rotation alternative. Use the cursor to define a z-axis rotation angle. Hold the Command-Shift-Option keys down and click in the center of an object. When you move the cursor, a line will extend itself from that center to the cursor and will then follow it wherever it goes. Click on some point on your object, like a side or a vertex, and the first line

will stick there. Immediately, you'll see another line behaving like the first one, following the cursor. The angle formed by the frozen first line and the floating second line provides visual feedback of the amount of rotation. When the angle looks right, click again, and the object will rotate by that much.

A ZOOM WITH A VIEW

Super 3D has several viewing options too. You can zoom in and out all you want. You can also instantly switch to a magnified view centered on any object in front of you. With the pointer tool selected, hold the Command key down, and drag a rectangle

You can build a solid from parts and have Super 3D do the drudgery of matching the surfaces so that no gaps or inadvertent offsets show. This simple example only hints at the possibilities.

Saving the World
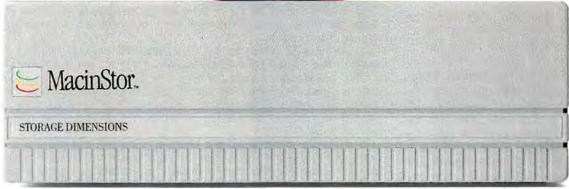
You can save the Super 3D world in several formats. When you save it as a Super 3D document, you can edit it later using all the available 3-D tools. You can save it as a PICT file, which is a format usable by word-processing, desktop-publishing (DTP), painting, drawing, and presentation programs. You can also save it in Encapsulated PostScript Format (EPSF), which is importable by DTP and graphics applications like CricketDraw and FreeHand.

Objects in a PICT or EPSF file can't be edited as 3-D solids, however. They contain a two dimensional *snapshot* of the 3-D world. You can still edit these files in whatever ways the importing application allows, but the third dimension is forever lost.

Lastly, you can save your work as text. Yes, T-E-X-T. The resultant file is an itemized description of each facet of your object(s). Super 3D's graphic language uses a few key words, like *polygon, fill,* and *shape,* combined with numerical data. You can examine and edit these files with any word processor. Why would you edit them? Super 3D can also *read* such files and construct 3-D worlds from them.

Super 3D's ability to use plain text as the source of 3-D objects lets you use it for generating shapes from mathematical calculations. You can prepare an appropriately formatted text file with any program that writes ASCII characters, including spreadsheets, databases, HyperCard, and custom applications. With the same basic language, you can create anything from 3-D graphs to entire buildings. Imported descriptions can generate more complex 3-D solids, whose outlines are not easily rendered, even with Super 3D's versatile tools.

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over an area. The area you encompass will be magnified to fill your viewing window.

There's also a "show as you go" option. Try manually translating or rotating an object and, instead of the dotted outline, you'll see the actual object redrawn as you move it. This is a bit slow, but it's very handy for precise alignment with minimal attempts.
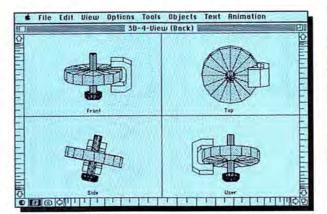
When Automatic Redraw is active, any change you make in the 3-D world will trigger a full or partial screen redraw reflecting your change. When Automatic Redraw is inactive, you can use most of the tools to zoom, spin, pan, and translate in any combination and sequence, but the screen won't reflect your changes until you manually trigger a redraw. This is a great timesaver, especially if your 3-D model is complex and requires minutes to redraw.

There are also four rendering modes: Wire frame, Faster, Better, and Best. Wire frame is very fast on the draw, and for the sake of speed, you'll use this mode more than the rest, especially during initial stages. The other three modes are for solid rendering, and each is more accurate, but slower, than the previous one. The Faster mode is a fairly responsive working view, but it occasionally makes hidden surface errors. The Better mode makes substantially fewer errors and can be used when you need to view the world accurately while still editing it. The Best mode renders flawless 3-D views, but it's far slower than the Better mode. It should be used for final views or for when you absolutely must have total accuracy during editing.

A QUESTION OF PERSPECTIVE

Perspective is the effect that makes a distant object seem smaller than an identical nearby object. It's what causes railroad tracks to apparently converge in the distance. In an orthographic view, distance has no effect on apparent size, and parallel lines remain parallel. With both views available, you can choose orthographic viewing for drafting accuracy, and perspective view for realism.

If you reshape a surface when your

These are the standard panes of the 4-view mode. Only the User view (lower right) responds to world rotation. All views respond to magnification, enlargement, object rotation, and any other editing function. With each change, all four views are automatically updated.

An Animated Discussion

What? Isn't it enough to hurl a few chunks of cardboard into space and create a starship? You want animation? "OK" says Silicon Beach. There's a menu dedicated entirely to controlling and recording motion. Super 3D lets you animate your world in several ways.

1) Manually reposition one or more objects by using combinations of mouse-drags and the spinwheels. Whenever you're ready, you can manually trigger the capture of a new frame.

2) Tell Super 3D to shift world views incrementally and save each step as an animation frame. The Spin/Translate Model dialog box lets you specify the amount of rotation and translation along the three axes, as well as the number of times you want to repeat the change. You control smoothness of the action by varying the magnitude of each step. Unfortunately, those controls only shift your view of the entire 3-D world, so everything appears to change. You can't apply this great feature to just one object of a set.

3) Drive the animation using a script — a text file that contains positioning instructions for any or all objects and also controls when each frame will be captured. Super 3D reads this file through the Animate Data menu selection. Any program that outputs text can prepare a script. The scripting language uses a few simple terms, along with x, y, and z values. With the proper calculations, and a little formatting, this method can produce impressive results with mathematically precise motions and views.

With any method, you can save a captured frame sequence as a named file, and replay it immediately from within Super 3-D, or later, with the supplied Projector utility. In either case, you can vary the replay speed by specifying the delay between frames or the frames per second. Playback can be as fast as 60 frames per second.

The results, even from simple animation attempts, can be impressive. Just the presence of this powerful feature deserves tons of praise. But I found a few rough spots in the diamond, and I hope they'll be improved in the next release. I selected an object and used the Transform dialog box to make changes along several axes in one step. I also used the Auto Record feature to add a frame to the show each time a change occurred. For frame one, I entered several values in the Transform box, and clicked OK. I intended the next frame to reflect the same changes I made for the first, but, unlike most Super 3D dialog boxes, the Transform box didn't remember my prior entries, so I had to retype them for *each* successive frame. Even better than remembering those values, why not include a Transform Again menu selection that bypasses the dialog box altogether?

After recording ten frames, I replayed the scene and discovered that each frame showed the object's handles! I could have prevented it by forgoing the Auto Record mode and deselecting the object before capturing each frame, and reselecting it for the next transformation. But that adds three additional steps per frame to an already tedious process. Showing handles in animation files should, at least, be an option that you can toggle off.

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Quit wasting time.

view is not perfectly perpendicular to it, you could unknowingly alter its shape in other dimensions, even though it doesn't seem that way from your viewpoint, since the surface you want to reshape seldom faces the camera squarely. Worry not: You can tell Super 3D to align your view squarely over a given surface. The process, however, isn't intuitive. You must first select the target 3-D object and ungroup it. Then you must click on the surface you wish to reshape, select Align Screen from the view menu, select the entire 3-D object again, regroup it, select Reshape Element, and *then* (gasp), you can start repositioning vertices. This capability is priceless, and I'm glad it's there in any form, but its zillion-step interface is totally unwarranted. It *should* go something like this: Select the 3-D object, select Reshape Element, which puts handles on all vertices, shift-click on the three or four vertices that define the target surface, select Align Screen, and then move vertices around.

4-VIEWED IS 4-ARMED

It's sometimes advantageous to see your world from several angles, and Super 3D helps you do that in several ways. Its 4-View mode shows a view along each axis, plus a "User's" view. You can freely change the User's viewing angle with the spinwheels, but the three axis views remain fixed at perfect right angles to the world. You can, however, zoom, pan, and dolly, in all four views. All views show changes in lighting, display modes, and the repositioning and resizing of objects. You toggle between 4-View and one-view with the menus or Command-4.
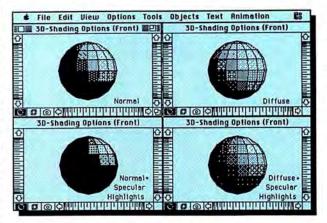
If a canned 4-View is too little or too much for you, you can set up your own multiple views, as many as you want, at any angle and position. In each view you have totally independent control of the display mode and lighting effects. In fact, these views share only your objects; otherwise, it's as if you had multiple Macs side by side, running their own copy of Super 3D.
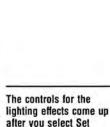
PRINTED MATTER

At any time you can print the contents of your current viewing window.

On a LaserWriter, objects print with high-quality halftones; on an Image-Writer, and on screen, you get coarse dithered black-and-white dots.

Speaking of printed matter, the doc-

umentation does a good job of presenting the basics of the interface and of introducing the concepts involved. What's needed next is an in-depth view into the tools and their use, including

The shading effects on each sphere are from one light source (from a possible four), but with different options selected. The light in all these views comes from the same direction.
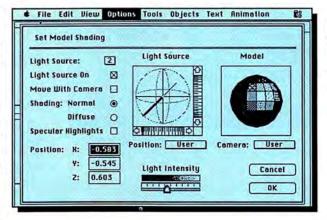
The controls for the lighting effects come up after you select Set Model Shading. You can turn on or off any or all lights, and you can vary the position and characteristics of each one.

The Light Fantastic

Super 3D has several ways to add light and shading effects. You can render objects as wire frames or as solids, then uniformly add one of 64 gray values; surface and edge shades can be set independently. You can also illuminate the world, which adds the appropriate 3-D shading effects to each object's surface.

To illuminate your 3-D model, Super 3D provides four independent light sources with variable characteristics. After you switch on a light, you can position it anywhere in the world, vary its brightness, diffuse it like the light on a cloudy day, and opt for *specular highlights* which gives a little extra glint to your objects. Any mix of these aspects is legal and changeable at any time. Any or all light sources can be attached to the camera so that your lighting turns when you do. This is handy when you do a lot of orbiting around the 3-D world and you want constant lighting. *Shading* darkens or lightens the tone of each facet based on its orientation relative to the light(s). This is not to be confused with *casting shadows*, which Super 3D does not support.

To use the lights, you must first display your 3-D model as a solid. For sanity's sake, if all the lights are off, your solid model will look stark *white* as opposed to the *black* that you might expect to see. You then choose Set Model Shading from the Options menu, which presents the lighting dialog box through which you control the attributes of all four light sources.

numerous examples and construction details (although that's beyond the scope of a user's manual). ·

LIMITATIONS AND QUIRKS

The version of Super 3D reviewed here doesn't support color, although it works well in the Mac II's color mode and works about four times as fast as on a Mac Plus or SE. It doesn't exploit the 60881 math coprocessor, which is all too evident when working with complex shapes and solid views. Super 3D Enhanced, available by the time you read this, will support full color and the coprocessor, which substantially increases its operating speed (see the sidebar "Color My World").

In addition to these limitations Super 3D (vanilla version) has a few quirks. Only one document can be open at a time, although with a document that has master objects, you can open a window for each object. Reshape-editing is limited by a completely avoidable fluke: Selected points don't stay selected if you use the spinwheels to alter your viewpoint. Similarly, selecting points in one view of the 4-View mode doesn't reflect that selection in the other three views. Selecting a surface is generally a tricky affair because Super 3D insists on selecting the surface *behind* the one you'd like to select. For example, if you click on the face of the cube that is nearest to you, Super 3D will select the face that is farthest from you.
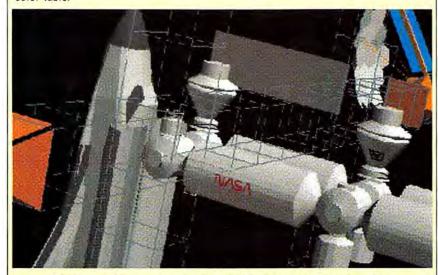
3-D GET READY

These are quibbles. I look forward to sitting down with Super 3D. Its modeling strengths overshadow its few weaknesses. After some hands-on experience, and after studying the user's manual in the bathtub and in supermarket checkout lines, I can look at most real-world objects and mentally dissect them into objects that Super 3D can render. That speaks highly of its creation and transformation skills. And even though I'm sometimes forced to wait for results, Super 3D is well worth waiting for. It's a jewel. I used it just last week to create an entire 3-D world. Then, on the seventh day, I rested. ▨

Color My World

Super 3D Enhanced shares all the features of Super 3D, and works in color on the Mac II. It will render Best-quality objects significantly faster than plain Super 3D does. The color-assignment interface is still in flux, but the method for shading colored surfaces has been firmed up: The lighting system is essentially unchanged, and all lights will be neutral white (in case you were wondering). With one or more lights turned on, an object's basic color will be darkened by uniformly mixing (dithering) black pixels with it. The on-screen shading looks exceptionally smooth, and the black-pixel dithering is virtually the same as a legitimately darkened version of the base color — all without the use or limitations of a special color table.

This is part of a much larger work produced for NASA by Design Edge using Super 3D Enhanced. Not bad for a beta.

Colored 3-D files will be savable as PICT2, which can imported into Pixel Paint, page-layout programs, and other applications that support color.

Following the wise tradition of newer Silicon Beach software, Super 3D Enhanced will be capable of importing plug-in tools. These can be written by anyone, at any time, and put to use without a basic program upgrade. The initial set of tools will permit translation of files to and from a number of other 3-D file formats created at other workstations. After that, the sky's the limit — or is it? A prerelease version of Super 3D Enhanced is already being used for storyboarding the production of the forthcoming *Star Trek V.*

SALVATORE PARASCANDOLO IS A PSEUDONYM. HIS REAL NAME EXISTS ONLY IN UNIVERSES WITH SEVEN DIMENSIONS, WHERE IT IS CONSIDERED RELATIVELY EASY TO PRONOUNCE.
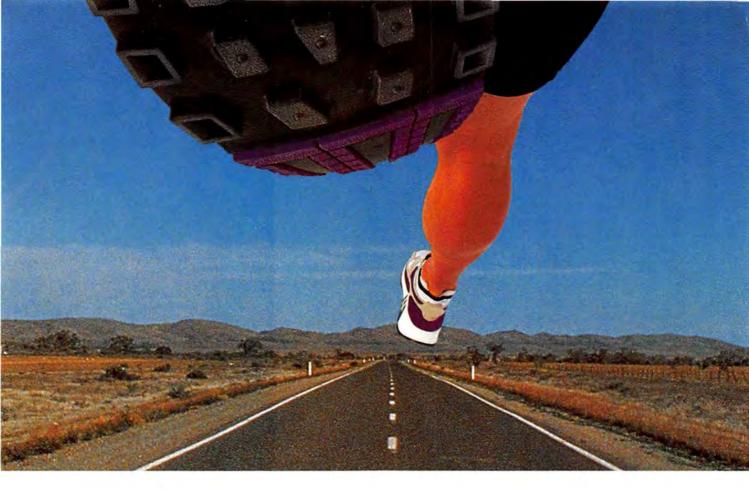
MACUSER RATING

Super 3D ♦♦♦♦½

Follows Mac Interface	■ ■ ■ ■ □
Printed Documentation	■ ■ ■ □ □
On-Screen Help	None
Support	■ ■ ■ ■ □
Performance	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ ■

Comments: 3-D software that you can get lost in — not with. Combines a simple interface with incredible power and time-saving capabilities. **Best Features:** Replicate and Sweep Surface tools compress hours of work into seconds worth of entries in a dialog box. Editing a master object puts massive changes at your fingertips by automatically changing all clones anywhere in the document. **Worst Feature:** You can't see selected handles simultaneously in all panes of a 4-View window. **List Price:** $295. Published by Silicon Beach Software, 9580 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126; (619) 695-6956. Requires 1 megabyte. Not copy-protected.

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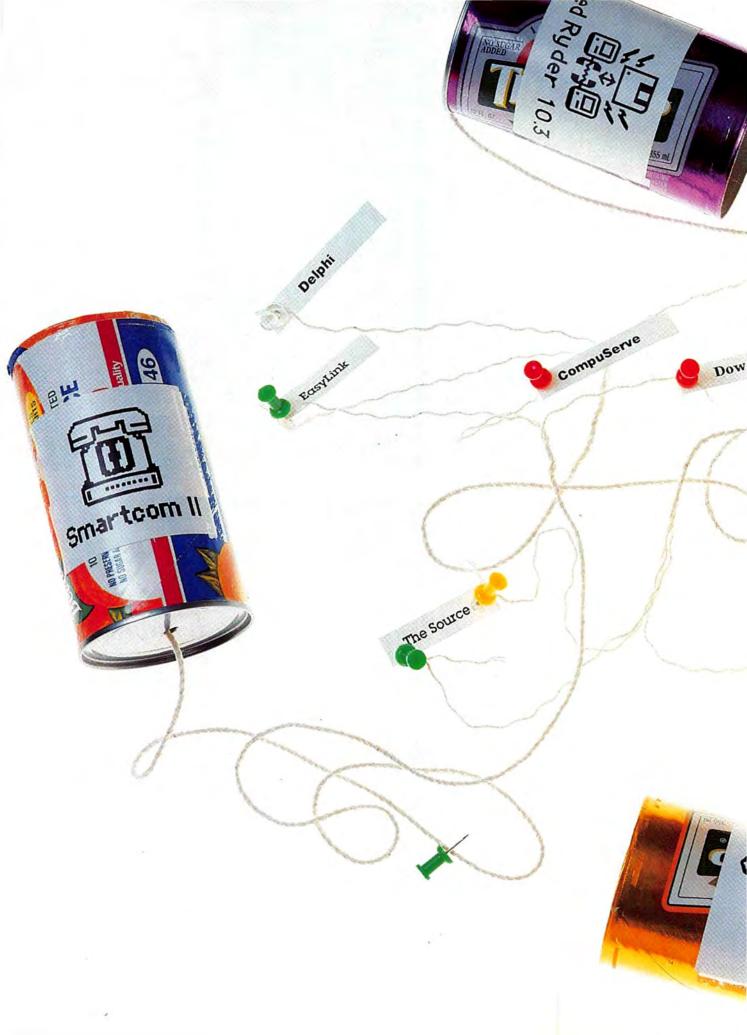
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Please circle 33 on reader service card.

A
Close Call

These three telecommunication programs give you every feature you'll need for connecting to the world of information services and bulletin boards.

BASIC CHOICES

The Macintosh is a popular tele-communicating machine. No one knows exactly why, but Macintosh owners are much more likely to have a modem than are users of other computers. Estimates of how many modems are connected to Macs vary, but run as high as 50 percent of all Macintoshes. Maybe it's because there's a built-in serial port with a little telephone icon over it. Whatever the reason, those modems mean there's a big market for communications software.

You can buy software to emulate almost any terminal, with specialty packages available like TeleScape Pro and VersaTerm. Then there are special-purpose programs that access particular services, such as AppleLink, MacNET, CompuServe Navigator, and Desktop Express (for MCI Mail). Front-end programs like MacWork-Station and FrontEnd access data on a mainframe whether local or across the country. There's even a communications programming environment for

BY ROBERT R. WIGGINS

writing your own programs: Acknowledge (see sidebar "Calling All Programmers"). Most users, however, just want a general-purpose communications program.

This is *MacUser*'s third look at general-purpose telecommunications software in three years, and once again the category is dominated by three products: MicroPhone II, Red Ryder 10.3, and Smartcom II. All three programs have been extensively revised and updated in the past year and deserve a new look.

As you can see from the features chart, all three programs are loaded with important capabilities, and they all perform their basic functions well. All three offerings have been overhauled to work with the Macintosh II and its larger screens, and all three have been made MultiFinder-aware.

MICROPHONE II

MicroPhone is the newest of the three contenders and has gained much popularity (and some notoriety) since it first appeared. It earned its popularity by combining ease-of-use with a sophisticated scripting language that gave it many powerful features. Even some IBM-oriented publications, not known for liking Mac software, praised MicroPhone. The notoriety resulted both from the considerable lag between the original release and a maintenance release that fixed some minor (yet annoying) bugs and from the even longer delay before the release of the more powerful MicroPhone II.

If you're new to communications, MicroPhone II can appear quite intimidating at first. However, the manual helps you get started, and the examples provided on disk are excellent. Many users will find these sample sign-on procedures, written as scripts, to be all they need. Using these examples you can log on to CompuServe,

Delphi, Dow Jones, EasyLink, GEnie, MCI, or The Source. These scripts provide automated ways to log on, log off, and perform simple tasks such as checking mail. The log-on scripts use dialog boxes to ask for the phone numbers, user identification (ID) numbers, and passwords needed, and then store them as text files to automate future log-ons. The sample scripts are even smart enough to select the proper log-on procedure just by noting your access telephone number. With these sample documents, you can use MicroPhone II's scripting capability without even knowing it.

DO IT YOURSELF

You still may want to write your own scripts, whether for other services or for other tasks on the supplied services. To help you write your own scripts, MicroPhone II has a powerful script-generating feature called Watch Me. In Watch Me mode, MicroPhone II records both what comes in from the other system and your responses. It then builds a script to duplicate the sequence. For simple interactions, this may be all you need. For more complicated sequences, especially those where the prompts might change from session to session, you'll have to do some editing to polish the script.

MicroPhone II is a scripting engine: The entire program is built around the ability to generate scripts. This is obvious when you look at the Scripts menu and find more choices than in any other menu. You can create new scripts, modify existing scripts, copy scripts, delete scripts, and export scripts to, or import them from, text files (useful for moving scripts between documents). The scripting language is essentially a programming language, with IF/THEN and REPEAT UNTIL statements. The SEND FILE and SEND LINE commands can be used to send the contents of text files one line at a time, which enables you to store variable information outside of the script. There's even a SKIP LINE command that lets you omit lines from the file based on the prompts received.

Once a script is written, either by

Calling All Programmers

Another recent addition to the Mac's communications arsenal is Acknowledge, from SuperMac Technologies. Rather than just another terminal program, Acknowledge is a telecommunications development environment that takes scripting into the dimension of true programming. The function of Acknowledge is to enable programmers to create custom terminal programs geared toward specific functions or services.

The heart of Acknowledge is TAL, the Telecommunications Access Language. TAL is a programming language, complete with local and global variables, that's specially oriented toward communications. Programmers use TAL to create a pyramid of routines that can perform almost any function. At the base of the Acknowledge pyramid are Modem Files, which are TAL routines for communications with the modem. At the next level are Network Files, which are TAL programs for handling communications networks. Then come Service Files, which are TAL routines for handling specific on-line services. Finally, at the top of the pyramid is the Connection. This is what the user deals with when the programmer is finished. Connections have icons and custom menus, and they can have custom dialogs. Many sample connections are included, so even if you're not a programmer you can benefit from Acknowledge's power.

That power is difficult to describe in a few paragraphs. Acknowledge has a built-in peruse buffer, and a programmer using TAL can control what appears on-screen and how the buffer is used. Acknowledge allows full access to fonts of any size, and can still update the screen at 2400 baud.

Acknowledge is intended for programmers. A talented TAL programmer can accomplish amazing feats (one TAL programmer wrote a simulation of Smartcom just to show it could be done). SuperMac has a developer program that, for a $500 fee, allows up to 250 run-time modules to be distributed with your custom Acknowledge connection.

So if you're looking for a custom terminal program, it may now be possible to develop one quickly in-house using Acknowledge. Acknowledge will handle the basic communications and let your programmers concentrate on programming.

"Daddy says he owes his success to who he met in college, who he met in business and to Mommy who told him to save his information on Sony data cartridges."
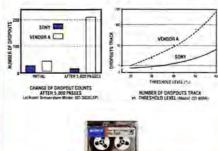
Yes, it certainly is important. Because a data cartridge is used for critical document storage. So it goes without saying that reliability is its most important asset.

And reliability is unmatched in Sony data cartridges.

After all, reliability in a data cartridge means only one thing: no loss of data. And, when it comes to that, Sony data cartridges have been proven measurably better.

As the two charts on this page show, Sony data cartridges have the lowest dropout rate of any data cartridges made. Even

after 5,000 passes.

Perhaps that's because only Sony manufactures every single

CHANGE OF DROPOUT COUNTS
AFTER 5,000 PASSES
(at Room Temperature Model: QD-300XL/P)

NUMBER OF DROPOUTS TRACK
vs. THRESHOLD LEVEL (Model: QD-600A)

part of their data cartridges.

Or perhaps it's because Sony has such a long history of painstaking perfection in data storage for every media.
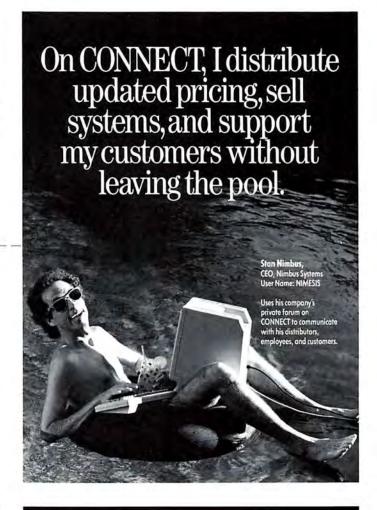
Including the invention of the 3.5" floppy disk format.

The benefit of all our expertise will not only help your firm, it will also help you at your firm when you tell them: To make sure your critical documents are safe, just save them on a Sony.

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What's the connection between everyone in your organization, all your customers, and thousands of other strange and creative minds around the world?
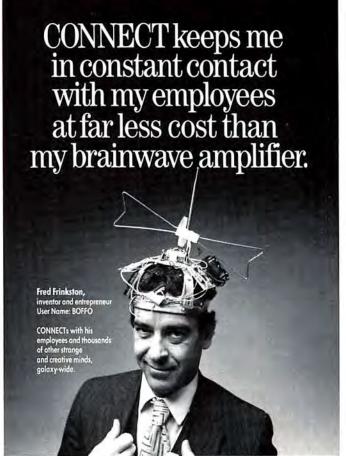
On CONNECT, I distribute updated pricing, sell systems, and support my customers without leaving the pool.

Stan Nimbus,
CEO, Nimbus Systems
User Name: NIMESIS

Uses his company's private forum on CONNECT to communicate with his distributors, employees, and customers.
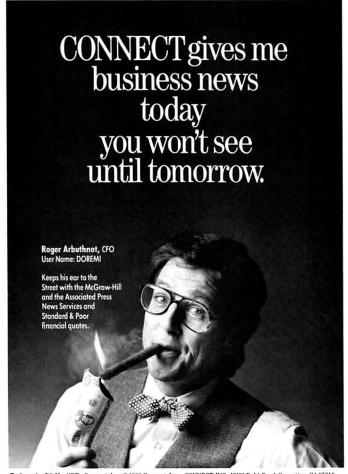
On CONNECT, I share graphics with all our 24 branches and swap sweet nothings with Tony in Tucson.

Sally Nampish, Manager,
Corporate Communications

User Name: MANGA
Routes copy, shares files and graphics for in-house PR and desktop publishing.

CONNECT keeps me in constant contact with my employees at far less cost than my brainwave amplifier.

Fred Frinkston,
inventor and entrepreneur
User Name: BOFFO

CONNECTs with his employees and thousands of other strange and creative minds, galaxy-wide.

you or by MicroPhone II's Watch Me, you can have it appear in the script menu, assign a Command-key equivalent, have it appear as a button at the bottom of the screen, or any combination of these. Up to 20 buttons are allowed across the bottom of the screen, but the actual number is limited by the size of the screen and the size of the buttons (which is based on the name of the script). Even this limitation can be skirted, however, by using the script commands INSTALL BUTTON and REMOVE BUTTON to dynamically change the available buttons.

MICROPHONE II'S FEATURES
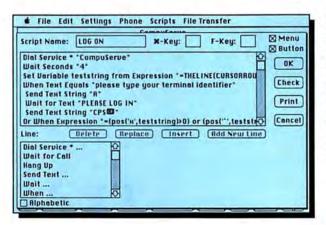
One big change in MicroPhone II from previous versions is the addition of modem drivers. This capability means you can now use MicroPhone II with any modem — not just Hayes-

MicroPhone II's buttons across the bottom of the screen can be clicked on at any time to invoke the associated script. Scripts can also appear on the Scripts menu, have a Command-key equivalent, have a function-key equivalent on an extended keyboard, or any combination of these.

MicroPhone II lets you select a modem driver in the communications-settings dialog, which is also used to set the communications parameters. Notice the check box for Hardware Handshake, necessary when using modems such as the Hayes V-Series.

This dialog is used to write and modify scripts in MicroPhone II. You don't have to remember any commands because they appear in a scrolling list. When you select a command, any modifiers appear in another scrolling list and a text-entry box for entering operands also appears.

◼ A Close Call

compatible modems. The program comes with six such drivers, and you can modify them or write your own using MicroPhone's scripting language. Among the six supplied modem drivers are No ATZ, for people whose modems didn't react well to an ATZ command; No Bells, for people who don't like all the ringing MicroPhone II does; and Telebit, for use with high-speed Telebit modems.
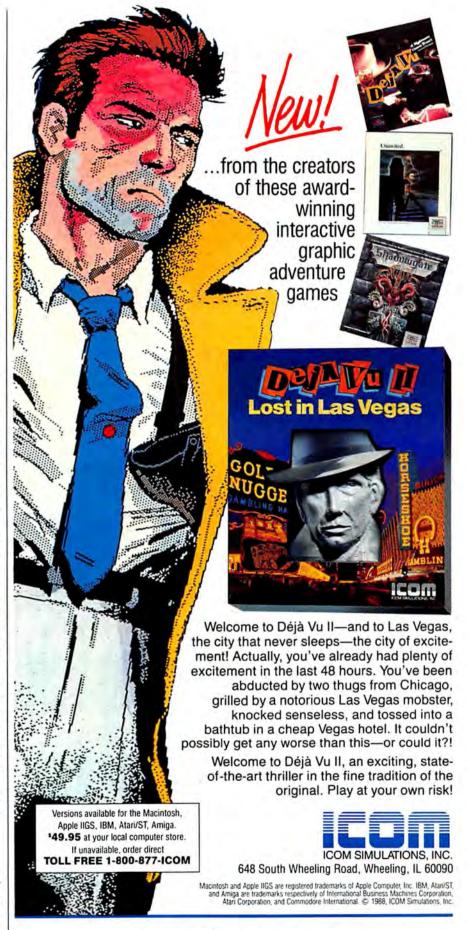
MicroPhone II's scripting power almost overshadows a pretty good terminal program behind the scripts. Like the other two programs, MicroPhone II has a scrollable buffer to retain the session. The buffer offers Copy and Paste capabilities, and you can save or print selected text from the buffer. Text can be displayed in the buffer with either 9- or 12-point characters. Unfortunately, the spacing used for the 12-point characters is too wide for an 80-character line to fit in a full-screen window on a Mac Plus or SE, which makes 12-point characters relatively useless. A major improvement in MicroPhone II is the speed at which text displays, and the program can now keep up at 2400 baud.

MicroPhone II also shines at file transfers. It supports all versions of Xmodem, the lesser-used Ymodem and Ymodem-G (a variant of Ymodem similar to Ack-ahead Xmodem), as well as Kermit, which is popular in academic circles. MicroPhone II also supports auto-receive when receiving from another Mac running Micro-Phone.

MicroPhone II is a major improvement over earlier versions. The major complaints of speed and modem incompatibility have been addressed, and the program has been polished. It even comes bundled with Glue, from Solutions, Inc., which allows any document to be shared with other Glue users, even when they don't have the program originally used to create the document.

RED RYDER 10.3

Red Ryder is no longer just a program; it's a legend. In the early days of the Macintosh, there were no terminal programs at all, and the only programming language available was BASIC.

■ A Close Call

Feature	SMARTCOM II 3.0	MICROPHONE II	RED RYDER 10.3
Command language	very good	excellent	excellent
Ease of use	excellent	very good	very good
Power	very good	excellent	excellent
Number of key equivalents	26	47 possible [1]	30 (10 at a time)
Number of on-screen buttons	none	20 maximum	30 (10 at a time)
Automatic procedure generation	no	yes	yes
Complex statements	yes	yes	yes
Compiled procedures	no	no	yes
Unattended operation	yes	yes	yes
Find capability	yes	no	yes
Maximum baud rate	38,400	57,600	57,600
Font support	9 and 12 point custom font	9 and 12 point custom font	any size any font

Data capture

	SMARTCOM II 3.0	MICROPHONE II	RED RYDER 10.3
Size of screen buffer	available memory	available memory	1 - 255 screens
Add to text file	yes	yes[2]	archive file only
Echo to printer	yes	yes	yes
Print text selection	yes	yes	yes
Full Cut and Paste support	yes	yes	yes

Protocols supported

	SMARTCOM II 3.0	MICROPHONE II	RED RYDER 10.3
MacBinary II	yes	yes	yes
Xmodem	yes	yes	yes
CRC Xmodem	yes	yes	yes
1K Xmodem	yes	yes	yes
Ack-Ahead (Turbo) Xmodem	yes	yes	yes
Ymodem	no	yes	yes
Ymodem-G	no	yes	yes
MacTerminal Xmodem	no	yes	no
KERMIT	no	yes	yes
CompuServe B	no	no	yes

Terminal emulation

	SMARTCOM II 3.0	MICROPHONE II	RED RYDER 10.3
Teletype	yes	yes	yes
VT52	yes	yes	yes
VT100	yes	yes	yes
Settable line width	10 - 132	80 or 132	20 - 132

Miscellaneous features

	SMARTCOM II 3.0	MICROPHONE II	RED RYDER 10.3
Graphics support	Hayes[3]	no	RLE
On-screen timer w/ billing	no	no	yes
On-screen transfer timer	yes	yes	yes
On-screen help	yes	no	no
Color support	Text and background	yes[4]	no
Print text file	yes	no	yes
Transfer to other programs	no	yes	no
Command keys for menu items	yes, if Control key	no	user option
Buffered keyboard (split screen)	no	no	yes

1. Use of all keys for Scripts makes some terminal control features unusable.
2. While a capture file is open, capture can be toggled on and off, but once closed it cannot be added to.
3. Use of Hayes graphics requires the other user to be using Smartcom II. RLE graphics is a standard graphics format.
4. When used with MicroEditor, a desk accessory that comes with the program.

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Dennis Brothers (who later went on to write MicroPhone) hacked the machine-language routines necessary for communications and wrote a simple BASIC terminal program called Mac-TEP. Wat Buchanon took the bare bones of MacTEP and fleshed out a more complete terminal program, called it Red Ryder, wrote some wild and zany documentation, which has become a collector's item, and distrib-

uted it as shareware. After Wat's untimely death, his partner Scott Watson took over the program, made it into a real application, and proceeded to make history as one of the most successful shareware authors of all time. One reason for his phenomenal success was the partnership he formed with his users, taking their suggestions, adding new feature after new feature, and writing new version after new version
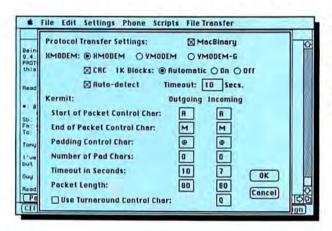
(he still holds the record for most new versions in a single weekend — he released three versions in three days at a Macworld Expo). When he got up to version 9.4, he decided to take a big step and leave shareware behind to go commercial. Red Ryder 10.0 (now up to 10.3 with maintenance releases, and there will surely be more versions to come) is the result.

For the first commercial version, Scott Watson started from scratch. He completely redesigned the user interface, completely rewrote the program, added numerous new features, and completely rewrote the manual. The result is one of the most feature-laden terminal programs ever written, but it retains the distinctive personality that made Red Ryder so popular.

RED RYDER'S CAPABILITIES

Red Ryder is the most intimidating program of the three for novices. It is designed to be used with any modem, so all modem commands must be typed. And while Red Ryder has a complete scripting language, it comes with no examples to learn from, and procedures must also be compiled before they can be used. Fortunately, Red Ryder has a feature similar to MicroPhone II's Watch Me called Write a Procedure for Me, which takes some of the pain out of the effort. In addition to Procedures (scripts), Red Ryder allows up to 30 macros, which appear in on-screen buttons (only ten are available at a time, but by selecting scroll arrows in the Macro Status Bar one of the three sets of ten can be made active). The macros can also be invoked from the keyboard. Macros are also allowed to invoke Procedures, further enhancing their power.

If you're an experienced telecommunicator, Red Ryder has plenty to offer. Like the other programs, it has a scrollable buffer, although the size must be set in advance, with full Copy and Paste support. But Red Ryder has many extra features that make the buffer more powerful. In a very basic mode, called TTY (an abbreviation for Teletype), text can be displayed in any font and in any point size. In VT100 mode, Red Ryder can shift each screen up in the buffer, thus saving the infor-

MicroPhone II offers many file-transfer options, including full control over Kermit transfers. MacBinary, CRC, and 1K blocks can all be disabled when required.

Red Ryder lets you choose any font and size for display, such as Venice, and still manages to update the screen at 2400 baud. Notice the General status bar at the top of the screen, one of three status bars available, which includes a timer with a billing accumulator.

Over the years, almost every feature of Red Ryder has been made an option, so that you can have total control of the program. These are the general preferences that don't fall into any other category.

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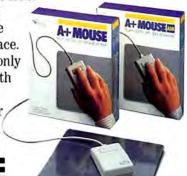
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mation for future use (a unique and welcome feature). You can use a buffered keyboard with a separate text-entry window that holds the text until you type a Return (very useful for real-time conferencing).

Red Ryder also has a host mode, allowing it to be manipulated remotely to send and receive files. While in host mode, it allows ASCII text transfers to be appended to existing files.

For file transfer, Red Ryder supports CompuServe "B" protocol (for downloading only), in addition to Kermit, Ymodem, and all forms of Xmodem. You can also use desk accessories during file transfers, even when you're not running under MultiFinder.

Red Ryder supports RLE graphics (for display only), so that you can view weather maps and other pictorial data available on some of the major on-line services. Red Ryder can also use the Option key as the Control key (most terminal programs use the Command key, and so can Red Ryder if that's desired), which keeps all the Command-key shortcuts in the menus available.
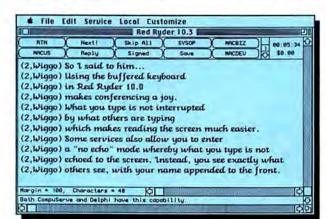
In short, Red Ryder includes just about every feature that any Red Ryder user asked for. This makes it a flexible tool, but with flexibility comes confusion, as the number of choices can be overwhelming, especially for new users. This is Red Ryder's biggest drawback. Once mastered, though, Red Ryder provides enough options to satisfy the most demanding user.

SMARTCOM II 3.0

Smartcom II for the Macintosh is an excellent program. Unfortunately, it's had to live in the shadow of the program's IBM version, which isn't nearly as wonderful, so many potential users have avoided the Mac version as well. It's their loss, as the Macintosh version is a joy to use. In an attempt to clear up some of this confusion (while actually just causing more), Hayes named the new version of the IBM software Smartcom III, while the Mac version is Smartcom II 3.0. When this confusion is coupled with the fact that many people think it will work only with Hayes modems (some of the program's features require a Hayes modem, but it can be used with any modem in direct-connect mode), Smartcom II is often overlooked.

For version 3.0, Smartcom II's programmers did a complete redesign. Previous versions had a fixed window the size of a standard Mac screen, while 3.0 has a movable and resizable window that even has a special "memory" box under the Zoom box that will return the window to a remembered size. This movable window makes Smartcom II more MultiFinder-friendly.

Smartcom II was the first Mac communications program to implement the now-standard peruse (scrollable) buffer and, in addition to full Copy and Paste support, offers a Find capability. Text in the peruse buffer can be displayed in 9- or 12-point characters, and the 12-point size is perfect for use

If you do much on-line real-time conferencing, you'll find Red Ryder's buffered keyboard to be a big help at keeping your thoughts straight. Notice also the Macro status bar at the top of the window, with 10 of the 30 macros available.

Red Ryder has a full scripting language. Unlike the other programs that help you build scripts, Red Ryder expects scripts to be plain text files that you can prepare with any text editor or word processor. Red Ryder has a built-in compiler that processes procedures just like any programming language compiles, complete with error messages.

Smartcom II 3.0 lets you set several preferences. The two "display alert" items are alert dialogs that many users complained about. They can now be bypassed.

on a Mac II with a larger screen. On a Mac II, Smartcom II gives the user a choice of colors for both text and background. And even though the window is no longer fixed, Smartcom II can still update the screen very quickly at up to 4800 baud (it can even keep up at 9600 baud, although it reverts to a "chunky" mode of screen updating, where large blocks of text appear all at once instead of one line at a time). Text in the peruse buffer can be printed or saved to disk at any time, or continuously.

PLENTY OF ICONS

The icon bar, which makes Smartcom II so easy for novices, is still present, although it's now a movable palette that can even be flipped onto its side (useful for Mac II screens). In normal mode (using a Hayes or fully Hayes-compatible modem), clicking on the phone icon starts the dialing process and then executes an autopilot (script) called AUTO LOG-ON. If you don't have a Hayes modem, using Direct Connect mode and clicking on the phone icon will just run the autopilot AUTO LOG-ON, which can contain all the modem commands necessary to dial the phone.

Writing "autopilots," called scripts in other programs, is also as easy as clicking on icons, because there is an iconic interface in that mode as well, with icons representing all the autopilot commands. Smartcom can also help you get started with the many samples on the disk, including examples for CompuServe, Dow Jones, EasyLink, GEnie, Knowledge Index, MCI Mail, Official Airline Guide, Telemail, and The Source. Each sample file contains the autopilots to log on and perform basic tasks. All you need to do is modify the log-on autopilots to include your user ID and password. Autopilots can be assigned Option-key equivalents, making it simple to invoke them from the keyboard, but Smartcom II still lacks the on-screen, service-connect buttons that the other two programs offer.

Features that only Smartcom has (although most of these can be simulated by scripts with the other programs) are on-screen help; automatic

baud-rate detection (where the program will adapt to whatever rate a connection is made at regardless of document setting and can even be told to connect at the maximum rate possible); baud-rate retention (where the program will always attempt to connect at the specified rate); and full support of the Hayes V-series modems, including transparent XON/XOFF

(the other programs require a modem cable capable of hardware handshaking).

Smartcom II 3.0 is a major improvement over previous versions. It fixes almost every complaint users have reported. Its only flaws are that it doesn't have on-screen macro buttons and that it supports only Xmodem for file transfer, although it does now support all

forms of Xmodem and can download in the background under MultiFinder (it even lets you use DAs while downloading when you're not using Multi-Finder). It remains the simplest terminal program to learn and use, and adds many features for the feature-hungry telecommunications user, particularly the Macintosh II user.

THE VERDICT

All three are full-featured, powerful programs that make telecommunicating easy. No matter what your level of technical or communications expertise, any one of these programs can fit your needs. So which is best?
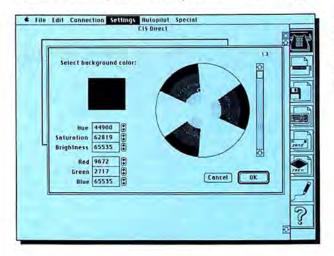
Overall, the nod goes to Smartcom II. Its ease of use, ease of learning, and many features make it the ideal terminal program for most users. Mac II owners will find it a particularly good choice with its color and large type.

Red Ryder comes next. Its extreme popularity and ubiquitousness make up for its more difficult learning curve, as it's very easy to find another user to help you over the rough spots. The staggering array of features it offers make it adaptable to almost any situation. It's also the least expensive of the three, making it an excellent value.
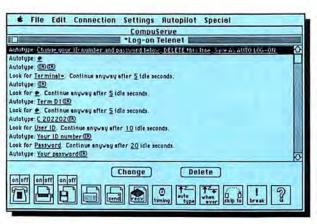
While it might seem strange that a program as powerful and flexible as MicroPhone II would place third, remember that this is essentially a photo finish. The rest of the field, and there are many other terminal programs including those for other computers, lag far behind these three. If scripting is your main need in a terminal program, then MicroPhone II should be your first choice. Between the scripting language and the modem drivers, there's almost nothing that cannot be accomplished with MicroPhone II. It just requires more knowledge and technical ability to get the most out of it.

Whichever of these programs you choose, you've made an excellent choice. There are no losers in this group, only winners. ▨

On a Macintosh II with a color screen, Smartcom II allows you to specify the text color and background color using the standard color picker.

Smartcom II makes writing autopilots as painless as possible by the icons at the bottom of the screen. Clicking on a particular command icon causes dialog boxes to appear where any further information required for the command can be supplied.

The call progress dialog in Smartcom II has been retained, including the cute telephone icon that follows the progress down the screen (and attention was paid to detail — the watch on the right hand in the dialing picture seen in previous versions was removed).

ROBERT R. WIGGINS IS MACUSER'S CONTRIBUTING BUSINESS EDITOR AND A SYSOP OF THE MAUG FORUMS ON COMPUSERVE. HE SPENDS SEVERAL HOURS A DAY USING TERMINAL PROGRAMS.

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The notes that follow come from
real-life problems and solutions. They
address one-user Macs as well as

networked machines, and most tips ap-
ply to every category.
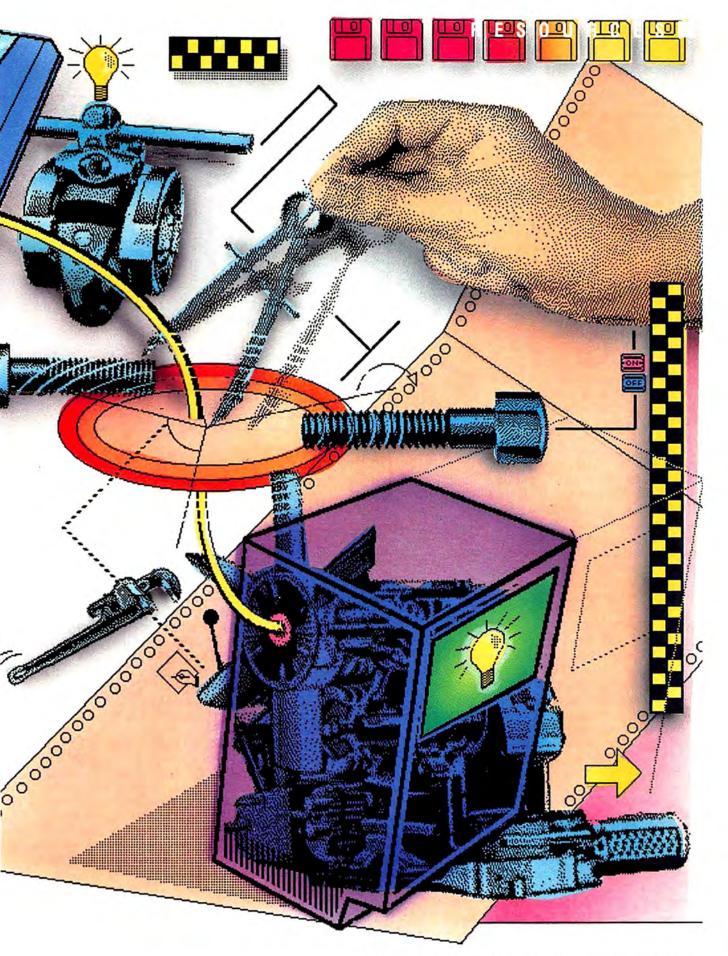
Publishing this advice in *MacUser*
may be preaching to the choir, but
even in a choir there are those who
could sing in better tune.

USE THE RIGHT APPLICATION

Using the wrong application for a
job is not only frustrating but also
wastes time and gives you an inferior
product. One sign of wrongness is
when you spend the whole day slaving
over something that could have been
done more easily on paper. Some clas-
sic examples: Using a painting pro-

BY SALVATORE PARASCANDOLO

DIDIER CREMIEUX

gram instead of a drawing program to make floor plans or charts, using Mac-Draw instead of Excel to make tabular forms (see Figure 2), or putting the wrong type of database program to work on a major project. This last one can be disastrous, especially if you find out that you should have used a relational program (Reflex or 4th Dimension), instead of that trusty flat-file manager (File, FileMaker Plus).

To choose the right program, always consider how much your output will *change* during its development and life span. How easily a program lets you make design and content changes is crucial to saving time and frustration. Keep up with news on emerging software and major upgrades. When some prospective lifesaver catches your eye, go on an information-gathering binge. Discuss it with colleagues, users, and dealers. Look for reviews. Call the developer.

An example of using the right application: If you write or conceptualize a great deal (and who doesn't), don't use a plain word processor or pencil and paper to brainstorm. Find a comfortable outlining application (MORE, MindWrite) or desk accessory (Acta, Outlook) and use it regularly. Become proficient with its thought-arranging powers, and you'll produce a better product in far less time. Guaranteed.

COMMAND YOUR TIME

A subtle way to unintentionally waste time is to use menus instead of Command-key equivalents for frequently used commands like Cut, Copy, Paste, Clear, and Save. On today's larger monitors, all those trips to the menu bar add up to a lot of miles. Regardless of how poorly you do it at first, use Command keys. Go for the menus only if you don't remember the right key. Then look for the related Command-key equivalent next to all menu selections, and soon you'll use them automatically.

Wouldn't it be great if you could teach your mouse where to click, which menu items to select, which files to open or print, and all kinds of frequent, repetitive stuff? Well, you can. Affinity's Tempo II is a DA that learns and faithfully replays sequences of
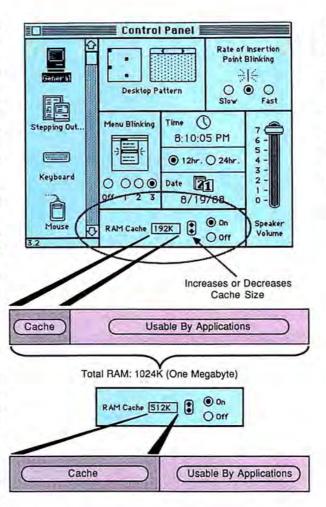
Figure 1. This section of the Control Panel lets you set aside memory as a holding area for recently read disk data. Unlike a RAM disk, the RAM cache won't let you see or control its contents, only its size. RAM Cache is not a free lunch — it takes away from application-running space.

mouse and keyboard events. Each lesson is called a macro. You give each macro a unique name and a corresponding key combination that starts the replay. QuicKeys from CE Software has similar capabilities, as does the Recorder in System 6.0. Some programs, like Excel, WordPerfect, and Word 4.0 support their own macros.
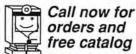
Macros are great for faithfully and frequently repeating long sequences of identical actions, such as preprint formatting. They're also valuable for one-case, one-day use. Let's say you find that many records in a large new database have been mistakenly filled out so that the contents of two fields need to be swapped. Moreover, some prefixes (say "016631B-" or "0244ZPH-") need to be added to another field in many records. You can't totally automate the process because you need to evaluate each record, but you can set up one macro that swaps the fields,

and two other macros to auto-type the prefixes precisely at the start of the incomplete field. After that, you just step through each record, examine it, press a couple of keys, and proceed to the next record. Once you've fixed the database you can chuck the macros, but you'll have saved countless hours of cutting, pasting, and typing.
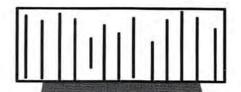
CACHE THAT RAM

The RAM cache (on Mac 512KEs and up) accelerates most operations that rely on frequent disk access. RAM cache is an area of memory that holds the most recently read disk data. When the cache fills up, newly read data starts to push the oldest data out of the cache. The larger the cache, the more disk data it will hold. When programs need to reread some disk data, the system provides it from the lightning-fast cache instead of refetching it from the much slower disk. You speci-

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AFFINITY MICROSYSTEMS
Tempo II 76

ALDUS
Pagemaker 409
Freehand 344

ALSOFT
Disk Express 33
Font/DA Juggler Plus 40

ASHTON-TATE
FullPaint 69
FullWrite 275
dBase Mac 275

BEDFORD SOFTWARE
Simply Accounting 199

BERKELEY SYSTEMS
Stepping Out II 49

BORLAND INTERNATIONAL
Sidekick 59
Reflex Plus 165
Turbo Pascal 64
Turbo Toolbox Mac 64

BRAVO TECHNOLOGIES
Mac Calc 72

BRIGHTSTAR
Talking Tiles 76
Hyper Animator 86

CENTRAL POINT
Copy II Mac 19
PC Tools Deluxe / Mac 38

CENTRON SOFTWARE
Casino Games 21

CE SOFTWARE
QuicKeys 50
Calendar Maker 26
Disktop 26
Quickmail 153

CHANG LABS
C.A.T. 2.0 236

CODA
MacDrums 29

COMPUSERVE
Compuserve Navigator 40

CRICKET SOFTWARE
Pict-o-Graph 105
Cricket Graph 119
Cricket Draw 169
Cricket Presents 289

DBFAST
dBFast Mac 115

DENEBA
Canvas 2.0 150
Coach 51

Comment 2.0 51
Coach Thesaurus 31
Coach Professional 99

DUBL CLICK SOFTWARE
Wet Paint Vol. 1 & 2 43

E.K.D.
MacTerm 83

FIFTH GENERATION
Fastback 51
Suitcase 40
Power Station 36

FOX SOFTWARE
FoxBASE Plus / Mac 200
FoxBASE + Runtime / Mac 160

ICOM SIMULATIONS
Iman 80
On Cue 35

IMAGINE SOFTWARE
Smart Alarms & Appt Diary 32
Smart Alarms Multi-User 79

INNOVATIVE DATA DESIGN
Mac Draft 149
Paste-Ease 28
Dreams 265

INTUIT
Quicken 33

LACIE
Silver Server 89

LETRASET
Ready, Set, Go 4.0 275

MACROPAC INTERNATIONAL
101 Macros for Excel 36

MARK OF THE UNICORN
Performer 316
professional Composer 39

MECA
Managing Your Money 125

MICROLYTICS
Wordfinder 32
Gofer 1.0 42

MICROSOFT
MS Word 3.02 248
Chart 92
Excel 250
Works 195
Flight Simulator 34
Power Point 259

NOLO PRESS
Will Maker 33

NORTHEDGE SOFTWARE
Timeslips III 115

SILICON BEACH SOFTWARE
Super Paint 2.0 102
Dark Castle 26
Silicon Press 40
Beyond Dark Castle 26
Super 3D 152
Digital Darkroom 152

SMETHERS BARNES
Prototyper 69

SOFTVIEW, INC.
TaxView Planner 63
Form Set Business Forms 50

Macintax 60

SOFTWARE VENTURES
Microphone 1.1 119
Microphone II 229

SOLUTIONS INTERNATIONAL
SmartScrap & The Clipper 36
SuperGlue 46
The Curator 72

SUPERMAC SOFTWARE
SuperSpool 5.0 54
SuperLaserSpool 2.0 82
Multi-User SuperLaserSpool 199
Diskfit 54
Network Diskfit 199
Sentinel 155
PixelPaint 259

SURVIVOR SOFTWARE
Mac Money 3.0 64

SYMANTEC
Mac SQZ 46
In Box Starter 199
Symantec Utilities 75
Lightspeed C 105
Lightspeed P 75
SUM Mac 58

SYMMETRY CORPORATION
Acta 2.0 32
HyperDA 36

TELEGRAPHICS
Hypertutor 26

TRAVELING SOFTWARE
Lap Link Mac 82

T - MAKER
Write Now 2.0 107

WORDPERFECT CORP.
Wordperfect 195

HARDWARE

CMS
SC 45 646
PRO 43 632
PRO 30 507

CURTIS MANUFACTURING
Safestrip Surge Suppressors 20
Diamond Surge Suppressors 32
Emerald Surge Suppressors 35
Sapphire Surge Suppressors 45
Ruby Surge Suppressors 55

CUTTING EDGE
CE 800K Disk Drive 172
Wedge XL 30+ 625
Wedge XL 45+ 825

DATADESK
Mac - 101 136
HyperDialer 26

DOVE COMPUTER CORP.
68020 Accelerator Boards for Mac
MSE 1 569
MSE 2 (1MB) 1029
MSE 3 (Math Co-processor) 759
MSE 4 (1MB and Math Co-pro) ... 1215
MacSnap 524 (512K to 1MB) 315
MacSnap 524E (512E to 1MB) 299

MacSnap 524S (512E to 1MB) .. 399
MacSnap 548 (512K to 2MB) 574
MacSnap 548E (512E to 2MB) .. 569
MacSnap 548S (512E to 2MB) .. 635
MacSnap 2SE or 1024 Option (1MB
Acc. or MacII Memory Exp.) 459
Macsnap 1024 464
Macsnap 2H or 2S 763
Macsnap 4H or 4S 1514
MacSnap Plus 2 469

FARALLON COMPUTING
PhoneNET-AppleTalk 120 9
PhoneNET PLUS 35
PhoneNET Star Controller 1225
PhoneNET Punch Down Block Wire
Kit 68
TrafficWatch 155

KENSINGTON
Mouseway 8
Mouse Pocket 8
Mac Plus/Mac SE Cover 9
Disk Drive Cleaning Kit 20
Macintosh II Stand 20
MasterPiece Mac II 103
System Saver Mac 66
Turbo Mouse 103

MIGENT
Pocket Modem 110

PRACTICAL PERIPHERALS
1200 Baud External Modem 105
2400 Baud External Modem 185
Mac Comm. Pac 2400 228

SOFTSTYLE
MacEnhancer 155

SUMMAGRAPHICS
MacTablet 12" x 12" 375

SUPRA
2400 Baud External Modem 140

THUNDERWARE
ThunderScan 4.0 with Pwr Port . 193
Mac II Power Accessory 41

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fy the cache size through the Control Panel (see Figure 1).

Most users know little or nothing about the RAM cache. Set at 32K and Off, it is unproductive but harmless. The danger comes when some Control Panel jockey, like your 6-year-old, also unaware of cache mechanics, plays with the settings and leaves you with a 512K-or-larger active cache. On a 1-megabyte Mac, this steals so much working RAM that some applications will refuse to run, or worse, crash while running. So check your cache now — we'll wait.

To set a workable RAM cache size for your Mac, take note of the memory needs of your biggest and most frequently used application, and adjust the RAM cache to take up any gross excess capacity. Consult the user manuals or activate MultiFinder and do a Get Info on each application. You'll see the recommended RAM size in the Info box. On a 1-megabyte Mac with floppies only, a 128K or even 256K or larger cache saves both time and wear and tear on disks. I once ran with a 512K cache (after careful tests) to dramatically speed up disk-happy Microsoft File.

If you frequently run multiple applications under MultiFinder on a 2-megabyte Mac, you'll need to determine carefully how much RAM you can really spare for your cache. With MultiFinder active, cache off, and your usual programs running, switch to the Finder and select About the Finder from the Apple menu. You'll see a RAM allocation box that tells you how much free space is left. Set your RAM cache to some value less than that. When you change cache settings, always do a Restart to make the change official.

USE A SAFE SCREEN SAVER

Many unsophisticated screen savers can cause crashes, temporarily mangle an application's display, or freeze a print job. Picture the frustration: There you are, half an hour from the Fed Ex pickup — plenty of time to print and package that 75-page document. So you start it up and walk away for a well-deserved 15-minute break. You chat, brag about just making the

Figure 2. Sure, these two forms look alike, but the Excel form was assembled faster, and it's usable for directly entering data which it will format and align properly. The Excel form will also calculate extensions and totals.

deadline, and leisurely sip a cup of brew. You return to the Mac and find, to your horror, that only 13 pages have printed because when the screen saver kicked in, it disabled the print job. Your poor Mac is wearing the equivalent of a blank stare, and you look no different.

The moral: Use a safe screen saver like Pyro! from Fifth Generation Systems. Its setup process lets *you* decide whether printing should be enabled during blanking.

LET THE NET WORK

A typical Mac network consists of several Macs and other devices (or nodes) using LocalTalk connections. A printer is usually on a node, and one or more Mac nodes may have hard disks with contents shared by other network members. The speed of data transfers through such a network is fast enough for the system to feel productive and open to each user. Occasional bursts of data and startups of large applications from a shared disk can cause a dip in response, but not for long, as most of these events involve only a few hundred kilobytes.

Networks bog down when large quantities of data are exchanged — a large database, a set of full-color images, pictorial works loaded with gray-scale photos, or folders containing many files. Large print jobs slow down the network and monopolize the printer as well. Reconsider the immediate need for large-scale activities. If the network is heavily used, postpone what you can until predictable lulls such as lunchtime, near the close of business, after normal hours, or early morning of the next day. You can also use the MultiFinder-based print spooler to print a file after a specified time of day.

SAVE, SAVE, SAVE

After you create a new document, which usually has the nonname "Untitled," set your preferences — fonts, rulers, grids, tabs, whatever — and then do a save. At this point you can name the file and save it *in its proper folder*. This lets you freely save (Command-S or its menu equivalent) without interruption while you work. If there's a crash, or a really big mistake, you can return to a very recent version of your document and continue with hardly a complaint — from you, or from those waiting for your work.
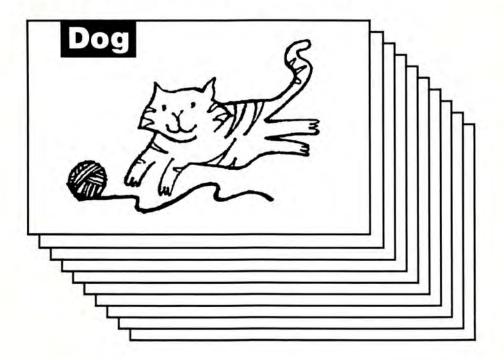
The rules for when to save are simple. If you're thinking about what to do next, save. If you're about to get involved in a conversation, save. If you're going somewhere, regardless of distance or time, save. If you're going to print, save. If you're about to select a desk accessory, or do something with an outcome you're not sure about, save. If that sounds like a lot of saving, it's less than you think, and you'll soon do it as unconsciously as tapping the Space bar between words.

FOLDER, WISER

It's easy to unwittingly scatter your files all over a hard disk. Suppose Rodney has just finished MacDrawing and closes his files, but doesn't quit MacDraw because he knows that you'll be using it next. You sit down, do your work, and then you quit. MacDraw asks if you want to keep the file, and asks you to name it. If you pay no attention to the currently open folder (above file names), your file is now in Rodney's folder. Better hope this isn't Rodney's trash day.

In the Finder, it's equally easy to drop an item into the wrong folder. If you accidentally release the mouse

Is your HyperCard playing with a full deck?

It can happen to the best of us. You file something and it gets lost in the stacks. Or what comes back from the stacks is different from what went in. Or you find yourself locked in a corner—can't go forward, can't go back.

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button while dragging something across the desktop, the file or folder will be gobbled up by whatever folder is currently highlighted. The disappearance may leave you baffled, as if you'd lost a contact lens in a wheat field. Find the lost item immediately with the Find File DA and put it where it belongs.

DON'T SETTLE FOR GENERICS

If you give your files generic names like *Report, myfile, X, Figure 1, stuff,* or *test,* chances are that you or *someone else* will unintentionally clobber one of those files with another one of the same name. You can spell *Report* only so many ways. Generically named files can be especially self-destructive if other users don't mind their own folders. By naming files strategically, you can control their order of appearance or have them list as a contiguous group for quick group-manipulation like printing, copying, or even intentional trashing.

A SUITABLE REPLACEMENT

Situation: You drag a file named *November 88* to a folder named *Reports* (the generic name is bad news already), and you get a Replace dialog box. The warning is there for a good reason. Be wary and click Cancel if you know that *you* don't already have a November 88 file in *your* Reports folder. The folder may be someone else's. Clicking OK could destroy a few days or weeks of someone else's efforts. If the file you're about to replace is really yours, you may still want to check the date on which each file was last modified. This will prevent you from replacing a recent version of that file with some older, forgotten version. File replacements are so swift and unrecoverable that you should double-check every step. On the other hand, if you know that you *should* be replacing an older version of a file, and you *don't* get a Replace dialog, it may indicate that you're saving your work to the wrong folder or disk.

DO WINDOWS

Take time to arrange your windows and their contents in a functional layout and occasionally adjust and refine
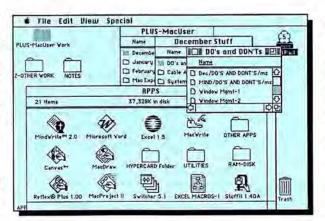

Figure 3. Nested folder windows are offset down and to the right, echoing their hierarchy. Notice the folders free-floating on the desktop for easy access. The trash can is kept visible, and frequently used applications are viewed by icon in their own window.

their position. If you need to see more of the contents of a shrunken window, don't resize it by dragging its corner, click the zoom box instead. When you're through looking, shrink the window to its original size with the zoom box.

Don't feel free to move or resize someone else's windows. If one is in your way, just close it. Once you've reached your own working folder, close all unneeded windows. If you use the Find File desk accessory, you can select any found file or folder and choose Move to Desktop (or Command-M) to automatically move the selected item to the Finder's desktop. There it will stay, for instant access day in and day out. When you're finished with it, you can automatically send it to its home folder, however deeply nested, by selecting the file/folder and choosing Put Away from the File menu. If most documents in one folder are from a single application, seeing 30 identical icons in one window only wastes screen space. Instead, use the Finder's View menu to display a window's contents by name, kind, size, or date. These views automatically arrange files in a meaningful order, provide valuable file information, *and* they let you see many more files in a given window. The By date view is especially handy because your latest work will always appear topmost in the window.

The few windows that *should* have icons are those in which your applications reside. Each application's icon is visually distinct, and it's a nicely sized target for a double-click. On a Mac II with color, you can color code the icons

for even greater visual distinction (see Figure 3).

RESPECT THY SYSTEM FOLDER

In most Mac offices at least one knowledgeable person, by some natural law, becomes the caretaker of the System's bells and whistles. That person tunes the contents of the System folder and installs useful stuff like Tempo II, Suitcase, desk accessories, fonts, dictionaries, and preferences for new applications.

If you're that person, you don't need someone dragging, re-foldering, deleting, and renaming things in such a vital area. If you're not that person, either learn the ropes or leave well enough alone. If you're the victim or cause of some problem with the Mac, teleport, don't run, to the System keeper and talk it out. If you're the lone user, get System-smart by carefully reading the installation notes that come with new applications and DAs.

Even if you're careful, you can still set up a situation where your System crashes unexpectedly. If this happens repeatedly, think back to the last thing you added or changed in the System folder. Occasionally new arrivals — INIT resources like Pyro! or Tempo II, for example — will conflict with what's already there, and suddenly nothing works, or your System crashes at startup. INITs are activated in alphabetical order during startup or restart. Incompatibilities can sometimes be corrected by adding a numeric prefix to the names of each INIT (1-<name>, 2-<name>), giving *you* control over the order of activation. Experiment with different prefixes un-

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til you succeed, or if nothing works, remove the offending resources.

WHERE NO MOUSE HAS GONE BEFORE

Be careful with new software. This includes games, utilities whose purpose you don't know, beta versions of software, and anything about which you haven't read or heard reliable good reviews. As System updates emerge, applications and DAs that worked with older Systems may suddenly not work or may subtly disrupt the environment. This is especially true of older applications, unsupported public domain works, or tricky and "spontaneous" programs.

Although most software isn't intentionally predatory, on a system with a shared hard disk you risk more than a casual bomb. Yours truly was beta-testing one of the recent crop of high-powered "so-and-so-II" programs on a shared Mac II. The poor stooge crashed, and not for the first time. But this time, when I restarted it, my Mac refused to recognize its internal hard disk. I practically had to sprinkle powdered bats' tongues on the thing before it finally came to its senses. If you're not into platinum magic, or you don't have a way to leave the country on short notice, stick to the good stuff.

WATCH THE MATTER ON THE PLATTER

With today's V-8 powered applications, it's not difficult to create a single file 200K or larger. In one way or another, disks of any size fill up. Shared hard disks fill even more quickly if files aren't periodically reviewed and disposed of by their originators.

Some ways to recover disk space: Compress large files that you still need to occasionally access. StuffIt, a solid shareware product by Raymond Lau, does this in an excellent and friendly manner (see Figure 4). Copy infrequently used files from the hard disk to floppies. Remove (by popular consent and proper procedure) System resources that are never used, like very similar DAs, color-related System files on a non-Mac II, drivers for printers you don't use, and strange System files that have been unwittingly copied

Figure 4. StuffIt compresses files and optionally combines them into one document. The "Size" column shows original size, and the "%Saved" indicates the reduction achieved, which varies depending on the document type and content.

along with newly installed applications. Reconsider the value of old mail, old reports, old Scrapbooks, exhausted BBS downloads, dormant shareware, goofy fonts that never look appropriate on anything, and that obsolete version of your resumé — you know, the one with all the goofy fonts.

MULTI-FIND OR MULTI-LOSE

If you have two or more megabytes of RAM, use MultiFinder to reap the benefits of LaserWriter print spooling. This is a great time-saver, especially on simple LocalTalk networks, where you may be waiting in a long line for access to the printer. Instead of waiting, dead in the water, your file could be quickly copied to a holding area on your disk, freeing your Mac to do more work and even print-spool something else.

SHUT DOWN BEFORE SHUT OFF

By selecting Shut Down from the Special menu, you tell the Mac to clean up its affairs (actually *your* affairs) and notify all active applications that it's closing time so they can do any last-minute work. Disk directories (desktop files) are updated with the most recent status of windows and files and will thus less likely be left dangerously unkempt.

If you're on a TOPS network and you've published yourself, it's especially important to use "Shut Down" and not simply switch the Mac off. TOPS will be alerted of your intent and will warn you and other network members who might be currently accessing your published files. TOPS also lets you cancel from a Shut Down at that point.
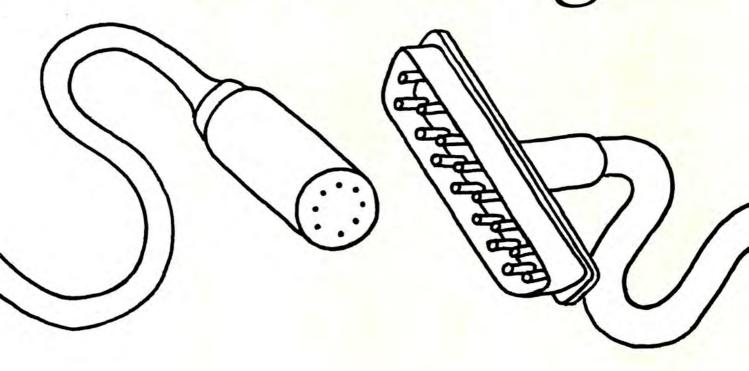
NEVER BACK UP YOUR WORK

Bad advice, of course, but are *you* taking it? Here are some sensible alternatives to disaster: If you're not inclined to do voluminous backups, consider programs like DiskFit that use a minimal number of floppies to back up a whole day's work. At least back up your current work manually using the old drag-to-another-disk method. If you shuttle your Mac between home and office, keep a recent backup in *both* places. You really don't want to rush home or to the office at some weird hour just to do an otherwise trivial recovery. If you're on an unmanaged network where backups are not centrally and faithfully managed, *back up your own work*.

If you back up on a floppy, don't keep both your backup and master work disks mounted (fully in the drive) at the same time while you're working. Chances are good that no matter how careful you think you'll be, you might end up working with the backup copy for several hours, thinking it's the master copy. Then by dutifully "backing up," you'll erase that precious new version by copying the obsolete master over it.

I hope that you'll find most of this advice old hat. Actually, the *original* version of this article had much better advice . . . yeah, that's it . . . some really neat stuff . . . but I accidentally dropped it into Rodney's folder, and never saw it again. . . . ▨

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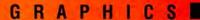
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I Second That Emulsion

When it comes to gray-scale image processing, ImageStudio and Digital Darkroom give you the same capabilities, but in different forms.

mageStudio and Digital Darkroom. Or was that Image Darkroom and DigitalStudio? Maybe it was DigitalImage DarkStudio? It's easy to get these two programs mixed up because they're so good at doing the same thing: They allow you to enter the big world of gray-scale image processing.

ImageStudio from Letraset USA of Paramus, N.J., and Digital Darkroom from Silicon Beach Software of San Diego, Calif., can accept any digitized, bit-mapped, gray-scale image and

BY TONY REVEAUX

work wonders with form, composition, texture, and light. Their specialty is retouching scanned photographic images for the purposes of creating halftone pictures. Although ImageStudio and Digital Darkroom can provide strong support for the photo illustration needs of mid-range publishing and may even achieve magazine-quality results under the right conditions, each package is also a sophisticated graphics program — the user's talent is the only limit.

These two packages can empower the graphics skills of users ranging from commercial airbrush retouchers in the fashion biz to photo-collage artists working with surreal images. You can cut and paste elements from different graphics into a new and heightened reality, or transform a photo by rearranging its elements from within. The retouching capabilities of ImageStudio and Digital Darkroom are a great leap forward from which there is no looking back. It is one thing to construct a unique collage. It is another, more impressive thing, however, to see those elements bonded seamlessly together with the cement of reality — texture, continuity, shadowing, and highlights.

Most photo retouching is done to confirm a familiar sense of The World rather than to warp it. An exterior location shot can be stripped of telephone wires, billboards, and traffic signs, with a stronger sky pattern dropped in. In a product shot, you can redefine shadows, highlight details, and then sharpen the profile edge of the subject for greater clarity. A fashion shot's background can be softened and diffused to halo the model. Retouching can be practiced as damage control, as well as a deliberate part of the creative process.

BATTERIES NOT INCLUDED

Both ImageStudio and Digital Darkroom can be used on a Macintosh Plus with a hard disk. That is, you can copy them onto your hard disk and open up each application, but don't expect to work on too many projects — the Plus just isn't big enough. And you're not much better off with the SE, either. To take real advantage of these

You can scan in photos and open them up in ImageStudio in one of the following formats: ThunderScan, MacPaint, RIFF, PICT2, FOTO, EPSF, and TIFF. You can also save in any of these formats; if you're going to export these images elsewhere, though, you might want to narrow your choices for saving down to PICT or TIFF files.

programs' capabilities, the minimum performance platform is a Macintosh II with 2 megabytes of memory, a large capacity hard disk, an extended video card, and a monitor capable of displaying 256 shades of gray. I used a Mac II with a 40-megabyte internal hard disk, a Peripheral Land Infinity 40 Turbo external drive with 44-megabyte removable cartridges, the Apple color monitor [*You can use any type of monitor, color or monochrome. However, you will get better results using a color monitor capable of displaying at least 256 levels of gray — Ed.*], a Dest

PC Scan 2000 scanner, which can read up to 256 shades of gray, and a Kurta IS/ONE digital tablet for detail work.

Gray-scale image processing is very memory-intensive. A file holding a full-page, 256-shade scanned photo can swell to well over 1 megabyte and may have to be split and carried on more than one floppy for travel to a service bureau. With ImageStudio, you can compress your files by saving them in Raster Image File Format (RIFF), though not too many applications will read these files. Another way to compress files in either program is to use the shareware program StuffIt. StuffIt will not only compact your documents, but it will also save them in a format that can be read by other page layout applications.

Now, there's a matter of working space within your machine. Some continuous-tone pictures can approach 10 megabytes. Don't get me wrong, 2 megabytes of RAM is enough to get by, but it constricts the editing area that can be held in the RAM buffer for one operation. A 100 percent scan of an 8-x-10 photo may be edited only a few square inches at a time. But 4 — even 7 — megabytes of RAM (one should be so lucky as to lay hands on this much RAM) would enhance the editing process considerably.

If you can't get the RAM, however, ImageStudio can help with its virtual memory feature [*ImageStudio 1.5 has this feature. You won't find it in version 1.0. — Ed.*], which allows you to scale a portion of an image while stor-

ImageStudio lets you run colors beyond the original image with the Paintbrush tool. Just select the brush size and place it in the area where you wish to pick up the particular color. Holding down the Option key while clicking the mouse button brings up the desired color in the paint palette. Now, just paint anywhere you want to extend this color.

Digital Darkroom has tear-off menus that allow you to keep track of the shade of gray or of the size and shape of paintbrush you're using. Another menu you can have on display is the Paste Control Menu. Having this on the screen while working is helpful. With its scale and gauge, you can tell how much you're lightening or darkening an image. This tool is handy when you want a ghosted image.

ing the rest in RAM. Digital Darkroom does not have such a feature.

Both ImageStudio and Digital Darkroom have provisions for starting a scanner from within the program, but be aware that the driver or module that comes with the scanner must be compatible with either the driver or module available from the scanner manufacturer. Images can be input to these programs from direct video capturing through cameras or frame grabbers from tape, disk, or broadcast. ImageStudio includes an input control panel under its File menu for Data Translation's QuickCapture video digitizer.

THE PROGRAMS, PLEASE

ImageStudio and Digital Darkroom have more in common than they have differences. Both are sophisticated and accomplished works of Macintosh programming and design. Like Page-Maker, they are complex, feature-laden working environments. To use them to their fullest, you might benefit by taking a class, if one is available in your area. Which one is for you? I've heard of some studios that have both. ImageStudio, with its richer palette of tools, offers more for the freehand, subtle nuances of retouching and creative texturing. Digital Darkroom, with its powerful outlining, curve generation, and global transformations, can be more efficient for preparing mechanicals.

HEAD-TO-HEAD COMPARISONS

You really begin to wonder if the

developers of both programs weren't identical twins, triplets, or quadruplets who were separated at birth. Just looking at the on-screen display capabilities leaves you having to check the About box to see which program you're using.

ImageStudio's Full Screen Toggle command pulls the image to the edges of the screen and leaves you to choose which of the four movable palettes you want to retain and where. Digital

Is Elvis still alive? Apparently he's been spotted about town, in different disguises. Guess the people at Letraset know something about it. Or do they? Let's just say that with ImageStudio, you can do funny things with a scanned photo, including changing the weather, altering a landscape, or indulging in (horrors) a form of graffiti. With its stamping tool and custom brushes, you can alter photos and have the changes hardly noticeable to the outside observer. The ability to select areas for copying and pasting comes in handy, too.

Darkroom simply lets you bring up or leave out its menus. Neither Image-Studio nor Digital Darkroom permit you to have more than one document open at the same time. But with ImageStudio, you can summon up as many copies of the current image as memory will allow, by invoking the Create Other View command. They will be interactive, so that editing changes to one will be reflected in the others. By zooming, sizing, and moving the windows around, you can work on a blown-up detail while monitoring its effects on the overall composition in a reduced full view. Both programs have keyboard shortcuts to change the cursor from whatever tool has been selected to the ever-handy Grabber hand. For ImageStudio it is the Option key; for Digital Darkroom it is the space bar.
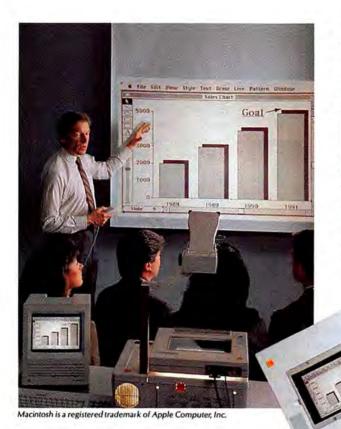
Both let you zoom in on different parts of an image, but each handles this differently. Digital Darkroom offers menu and keyboard commands for six magnitudes of zoom — the idea being that your active tool should remain in place. In ImageStudio, you choose a zoom tool to travel through its seven layers of magnification. I prefer the tool. I can center the zoom exactly where I want it in the image instead of playing scrolly-bar to get there.

GRAY MANSIONS

Both programs have gray-map editor controls that permit you to alter the gray values for all or a selected part of the image. With separate sliders for brightness and for contrast, you can preview a great variety of possible tonalities of the image. This instant feedback is more like video than the delayed action of photography. A gray-map graph box reflects the current balance of brightness and contrast, and you can manipulate that line setting directly to affect both values.

Digital Darkroom goes further in articulating its gray mapping. Numerical values are displayed for the slider settings, there is a main map and a base image map, and you can summon up a histogram — a bar chart that reveals the original distribution of gray shades scanned into the image.

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these programs can draw satisfyingly dazzling special effects from gray mapping that are available from their menus. You can posterize an image in enough different ways for ten Summers of Love. With ImageStudio's Filter menu, you can repeatedly blur, sharpen, soften, diffuse, and trace edges, and achieve a star lens effect — and combine these too. In Digital Darkroom you can replace, blur, smudge, texture, stamp, lighten, and darken them. A section in the manual shows how you can combine these effects to show movement, create a bas-relief or a Sabbatier effect, solarize, and emulate an oil painting or a mosaic. And when you are ready to start altering the image, Digital Darkroom has a unique Paste If function. You can determine the gray values you want to paste in, or those to be pasted over. Like the search-and-replace function in a word processing program, this feature allows you to make global image changes based on gray-scale values.

POWER TOOLS

The tool chests of these programs are as distinctive as heraldic shields from two different castles, and reveal the programs' divergent approaches to graphics. Digital Darkroom's tool chest is deceptively minimal. Four se-

Don't expect to trace at the push of a button.

lection geometries and a Magic Wand that selects shapes with similar gray values are available; when you choose one of these, New, Add, Refine, and Subtract options appear for enhancing the selection. You can use a Lightning Bolt tool to "zap" and deselect elements, and a Scissors tool to cut them. There is no pencil (which I dearly miss), but you can use the Brush and Airbrush for retouching. The shape and gray palettes are available from the Tools menu, as are brush modes such as blur, smudge, stamp, and lighten/darken. Other options let you choose to perform image modifications inside or outside of selections, from a corner, or from the center. I wish that ImageStudio had these transformation functions: scale, rotate by degrees, stretch, distort, slant, and perspective. When you are assembling a collage from very different sources, these tools can make the difference be-

tween the look of something that has been custom-tailored and of something from the "On Sale" bin.

Having irregular, somewhat upredictable areas spring to life when you touch the selection wand to a given point in the image may need a bit of getting used to. Beneath the surface of Digital Darkroom lurks a powerful and restless fractal genie that performs like an expert system for edge detection, contour mapping, and density matching. It often seems to have a mind of its own, and you should allow extensive trial-and-error time to get the feel of it.

Autotracing, Digital Darkroom's most celebrated feature, is a milestone in Macintosh desktop graphics. And it's not just destined for producing juvenile coloring books. It can help save time on jobs such as producing documentation and instructional materials, map making, and logo design when average photographs of industrial processes, aerials, and natural objects need to be quickly reduced to definitive clarity. This alone could be worth the price of the box.

Don't expect to trace at the push of a button. Until you have the gray map and trace options set just right, the first results on your screen may resemble the surface of Neptune as seen by NASA's Voyager. Be prepared to encounter many documents — such as low-contrast photos, painterly renderings, and topographical maps — that are simply too "thick" ever to autotrace well. You can treat the resulting objects as polygons or Bezier curves, enabling them to be exported to programs like Adobe Illustrator for further fine-tweaking.

Though ImageStudio doesn't have a tracing feature, there are ways to get a jumpstart on outlining. You can lasso and crop, adjust the gray map to high contrast, and try sharpening and tracing edges to different degrees. What ImageStudio does have is an awesome array of options for retouching. Its tool box has the Grabber, Zoom, Selection Rectangle and Lasso. Its six retouching tools include the familiar Eraser, Pencil, Brush and Paint Bucket, and then these specialized implements: The Rubber Stamp can "stamp" an

Here's a "perfectly normal" photograph scanned in and opened in Digital Darkroom, which can read PICT, TIFF, MacPaint, or ThunderScan files. To reduce the size of an image that can open in Digital Darkroom but you feel is too large, select the area you want to retouch (you would select the photograph itself and leave out the white space) with the box tool. Save the image (you can overwrite the old one since the new is basically the same, minus the white space). Now reopen it, and you'll get a cropped version of the photo.

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Thunderware

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Would you trust these people? Like ImageStudio, Digital Darkroom lets you have a little fun with scanned images. Digital Darkroom has a better handle on this craft by virtue of the tools available. You can use the Smudge tool to smudge shades and textures to give a new look to subjects. You can use the Free Rotation tool, for example, to turn a hairpiece to fit onto another person's head. The Distortion tool allows you to torque and twist objects. You can also select areas to copy and paste onto other parts of a photo.

individual pen-based graphic element, or create a wide variety of lines and textures by dragging and overlapping. The Charcoal, like its carboniferous namesake, is a progressive shading tool. The Water Drop blends shades already in the image and can successfully "weld" the joins between different graphic elements. The directional Fingertip can also help in feathering and melding edges and joins with a smear-like dither that diffuses the shades beneath it.

These tools can use graphic elements from the Pen and the Custom Pen menus, as well as defining the size and shape from the brush menu. There are so many elements — airbrush, candy cane, charcoal, leaf, meteor, pipeline, smear, heart, slash, stair step, star streak — and you can create your own to add to the list. The variety of options expands to become almost infinite when you open up the Shading Preferences menus for each. There, you can enable ten different degrees of pressure, shading changes, skip timing, and pixel frequency, and determine its action on lighter and darker shades, and only on the background or the image. The variety and subtleties of ImageStudio's freehand drawing approaches that of the traditional studio, aided and abetted by the automation of computer graphics.

PICT OFF

After outlining an image in Digital Darkroom, I could then bring it into ImageStudio for texturing and retouching. Or port a document from ImageStudio into Digital Darkroom to take advantage of its despeckling capabilities and for stretching and slanting elements in the document. Both programs are fluent in graphics interchange formats, which is so important for their usefulness to other applications such as page layout and presentations. ImageStudio's basic format is RIFF, and it can also "speak" TIFF, PICT2, ThunderScan, MacPaint, FOTO (PageMaker 1.2), and Encapsulated PostScript Format (EPSF). Digital Darkroom's native document format is PICT2, which tracks 256 shades of gray for each pixel. And it provides helpful hints for trading images back and forth to HyperCard.

The documentation is first-class in both programs, with tutorials and illustrated examples for each step of the way — vital for comprehending the many variations each function offers. Letraset includes a 20-minute video for ImageStudio. It could pass for a flashy show demo, but it is right on the mark as a fine example of documentation, communicating the magic in motion that these graphic programs deliver better than any manual could.

SCANNED, SCREENED, DELIVERED

At the end of this input process, it's what is inked on pulp that really counts. The completed image of a 256–gray-scale scan can be run out on a laser printer at 300 dots per inch (dpi), on a Linotronic 100 at 1,270 dpi, or a Linotronic 300 at up to 2,540 dpi. You can get the best results when there is an educated balance between scanned resolution, screen ruling, screen angle appropriate to the image texture, and the resolution of the printer. A hefty trade-off for heightened resolution is the time it takes the printer to crank it out: approximately 20 minutes to an hour on a Linotronic 300, and that's not counting development.

Even when run out on a Lino as a negative plate, the final printed image may not have the same quality as those you see in *GQ* or *Interview,* let alone what you remember from the original photo. With editing, that image has gone through generations of interpretation and reconstruction. The jury is still in session, but the final results from these programs, depending upon the existing output technology, is adequate for mid-range publishing but not consistently clean and sharp enough for commercial production standards. Though at the rate the technology is advancing, such as with Digital Darkroom's Advanced Halftone printing option (which allows you to set the degree of image sharpness and compensate for output variations), your snapshot could make its digital debut in *Time* within a year — but don't hold me to that.

SO WHAT WILL IT BE?

ImageStudio (selling for $495) and Digital Darkroom ($295) are more than programs . . . they are mini careers in graphics publishing. Like PageMaker, they provide a strong structure for building complex documents. But to match them as a paradigm, PageMaker would have to include prose, poetry, and playwriting modules. As with the exploding color paintbox of Pixel Paint, the creative potential in these two gray-scale heavyweights can be addicting and exhausting. Scanners are slowly trailing

the acceptance of their brethren fax machines, and printer output is reaching as high as a Scitex while it is filtering down to the quick copy shop. Selective photorealism on the Macintosh, as served by ImageStudio and Digital Darkroom, is already beginning to resculpture the landscape of desktop publishing — from Four Corners to the Twilight Zone. ⌘

TONY REVEAUX IS A SAN FRANCISCO-BASED WRITER AND CONSULTANT WHO IS THE EDITOR OF COMPUTER PUBLICITY NEWS, A COLUMNIST FOR COMPUTER CURRENTS. HE IS ALSO A CONTRIBUTING EDITOR FOR ARTWEEK.

MACUSER RATING
Digital Darkroom 1.0
�525♥♥

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ ■ ■ ■
On-Screen Help	N/A
Performance	■ ■ ■ ■ ■
Support	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ ■
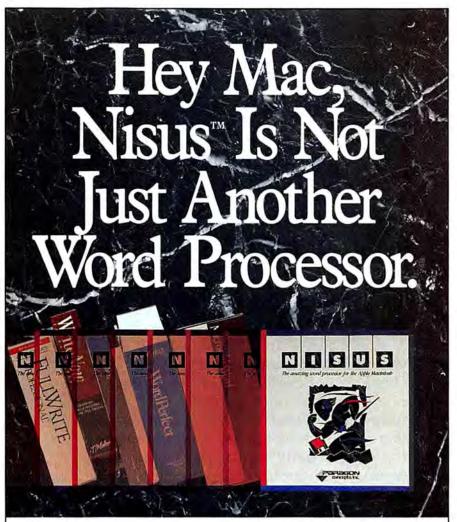
Comments: With its blending capabilities, this program really takes advantage of all the 256 shades of gray available. **Best Feature:** Magic Wand with its auto-tracing capability. **Worst Feature:** Requires System 6.0 or later. You will be limited in your activity if you have earlier versions of System software. **List Price:** $295. Published by Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956. Not copy protected.

MACUSER RATING
Image Studio 1.5
♥♥♥♥½

Follows Mac Interface	■ ■ ■ ■ ■
Printed Documentation	■ ■ ■ ■ □
On-Screen Help	N/A
Performance	■ ■ ■ ■ ■
Support	■ ■ ■ ■ □
Consumer Value	■ ■ ■ ■ □

Comments: Image Studio 1.5 is a virtual retouching studio on your desktop but it pales a bit in comparison to Digital Darkroom. **Best Feature:** Virtual memory. **Worst Feature:** Limited movement (rotation) of selected objects. **List Price:** $495. Letraset USA, 40 Eisenhower Drive, Paramus, NJ; (201) 845-6100. Not copy protected.

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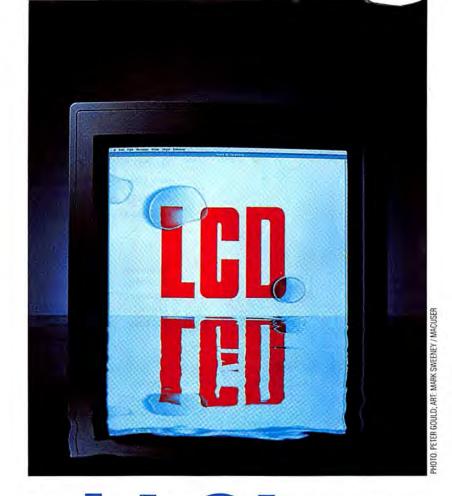
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Through the

Liquid Glass

Interactive LCD panels pump new life into overhead projectors. But at prices starting around a grand, should they replace acetate transparencies?

By Jeff Pittelkau and Diane Wilde

H aving the world's greatest ideas won't do much good unless you can persuade someone to put up hard-earned cash to make them reality. The proof is in the presentation, and every salesman knows that it's the sizzle that sells the steak.

So let's talk sizzle. Here at the MacUser Labs we may be cloistered with our 'scopes and torque screwdrivers, but we've heard all about the emerging market of desktop presentation. Nonetheless, having a practical bent, we decided to focus on one of the most ubiquitous, underrated, and overlooked presentation tools in the business world. OK wireheads, fasten your seat belts. Let's talk of a really important leading-edge technology: the overhead projector.

Don't despair, all you acetate jockeys

and meeting-room mavens, we come to praise the overhead projector, not to bury it. New technology has arrived in the Macintosh marketplace that enables your Mac to directly display impressive presentations for large audiences. Liquid-crystal display (LCD) panels, designed for use with an overhead projector, might be the answer to your prayers for a better presentation system.

With one of these panels sitting on an overhead projector, you can put a Mac's screen image onto a wall or screen for all to see. These panels let you display a screen at 30 or more times its actual size — that's about 5 feet or more measured diagonally. And while only a few of the LCD panels we tested were capable of reacting fast enough to project on-screen animation, the potential is there.

LCD Comparison

Apollo PC 9500

The Apollo PC 9500's most salient feature is that it has no protective glass covering the panel, making for a very fragile unit. The instructions come with a note on how to clean up the mess if the panel breaks and the liquid crystals spill out — not a good sign.

Apollo Audio Visual
60 Trade Zone Court
Ronkonkoma, NY 11779
(516) 467-8033
$1,798

THE MEDIUM IS THE MASSAGE

Software such as Microsoft's Power-Point, Letraset USA's StandOut!, Aldus' Persuasion, Symantec's MORE II, and Cricket Software's Cricket Presents enable you to create top-quality presentations as either slides or overhead sheets. While slides can be extremely effective, they're also expensive and take time to change. Consequently, transparencies remain the most widely used presentation medium.

Most laser printers can produce acetate overlays from Macintosh presentation programs, and this gives you the freedom to revise a presentation almost up to the last minute. When you slap them onto the surface of an overhead projector one after another, they help sell your subject. But let's face it, pulling acetates back and forth is not exactly, well, *sizzling*.

Lugging a Mac to every conference room might not be your idea of an elegant sales technique either, but we never said making a sale would be easy. To get some

sizzle going, you'll need to add something new to your overhead projection pitch. Large-screen video-projection systems can cost anywhere from $2,000 to $5,000 or more, and setting them up is a job for a technician, not a casual presenter. The availability of LCD panels for the Mac now puts the price of real-time projection under $2,000. And best of all, you can carry them in a pouch smaller than most briefcases and set them up yourself.

THE FINE PRINT

Unfortunately, there are a few problems. Some panels can reach extremely high temperatures — greater than 115 degrees — that cause the image to lose contrast, not to mention the risk that you will burn your fingers. A few panels don't have fans to reduce temperatures and keep dust away from the surface of the display. Others have no protective glass covering at all — this means a big mess that might require the services of the local toxic-waste disposal team if you

should accidentally drop the thing.

If you imagined using a customer's on-site Mac for your presentation work, think again. Start pumping iron. Lugging a specially prepared SE or Plus will be your lot. Every LCD panel we looked at requires a video patch to plug it into an SE or Plus. (By the time you read this, one of the first display units for the Mac II should be out — the nView II+2 from nView uses a Y-connector off the Apple video card.)

One manufacturer, however, has come up with a solution that bodes well for the future. The In Focus Systems PC Viewer comes with a 75-screen memory that enables you to store screen images and display them without a computer and by using an infrared remote-control device. It's also, as you might expect, the most expensive panel we looked at, listing for $2,795. But the idea is a good one, and we hope that other manufacturers will start offering a memory feature like this in the near future. Another neat on-the-go option is the Colby WalkMac SE from Colby

Computer Accessories
Mac Data Display

The Computer Accessories Mac Data Display has a built-in fan to keep things on the cool side, but the absence of an air filter means it will collect dust over time. The display is slow to react to screen changes and is suitable for VideoWorks II applications only at rates of 3 frames per second or slower.
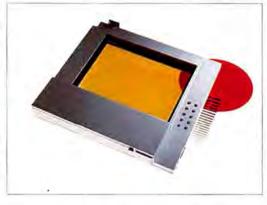
Computer Accessories Corp.
6610 Nancy Ridge Road
San Diego, CA 92121
(800) 582-2580; In CA, (800) 582-0852
$1,499

In Focus Systems PC Viewer 6448C+2

Systems (4723 N. Warren Ave., Fresno, CA 93705; (209) 222-4985). This portable Macintosh uses an LCD that is backlit for regular display. The LCD can be detached from the main body of the computer and put on an overhead projector to act as a real-time electronic transparency.

Some of the display panels in this report offer perks like the double supertwist LCD technology, along with both Mac II and IBM compatibility. These panels also cost more, but if you want to make the sale, who's going to scrimp?

INSIDE OVERHEADS

Before going any further, we should explain how these devices do their stuff. All these displays are based on the same technology that you see every day in watches and calculators.

Normally we think of crystals as solid geometric forms in which all the molecules or atoms are arranged in an orderly pattern, or *matrix*. *Liquid crystals*, on the other hand, are molecular components of a chemical substance. This substance flows like a liquid, but under the influence of an applied electrical field it turns either opaque or clear when polarized light passes through it. (See sidebar "How It Works" for more details.)
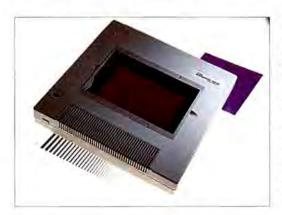
Conventional LCD panels emit no light of their own. They simply control the amount of light that passes through them, with either a back light or a mirror that bounces ambient light through them. Projection LCD panels, though, have neither a back light nor a mirror — just the LCD panel itself, which looks like a transparent piece of tinted glass.

PORTABLE OR LUGGABLE?

The LCD overhead-display panels themselves are compact and lightweight. Several of the units we looked at either include or offer as an option a case that makes transporting them as easy as carrying a briefcase. All the units with cases weighed 12 pounds or less including the case, but the key question is whether the case will protect the unit from damage.

For off-site presentations, you could grab the LCD unit in its case and travel to your destination, where all you'd need would be a Mac SE or Plus equipped with a video adapter for your particular panel, an overhead projector, and a screen or wall on which to display the image...whew! If you plan to use the panel at alternate sites, most manufacturers will sell you an extra video interface for about $100. But you'll still need someone with technical skills to pull the back off a Mac and wire the interface to the monitor video cable.

Unless you're comfortable working with electronics and have all the necessary tools, installing the video interface should be performed by a dealer. It took a trained MacUser Labs technician less than an hour to install each interface. Installation was straightforward for each unit with the exception of the Kodak unit, which requires you to drill a hole in the back of the Macintosh case — not an elegant design decision. The easiest unit to install was the Network Specialties

Kodak Datashow HR/M

LCD Comparison

LCD Overhead Projection Panels

	Apollo Audio Visual PC 9500	Computer Accessories Mac Data Display	Eastman-Kodak Datashow HR/M
Price	$1,798	$1,499	$1,595
Resolution	512 x 342	512 x 342	512 x 342
Fan		yes	yes
Air filter			yes — removable
Heat-reflective glass		yes	yes
LCD type	super-twist	super-twist	DTN
Filter	blue	blue	
Display color	blue-on-white	blue-on-white	black-on-white
Startup contrast ratio	2.0:1	3.6:1	8.4:1
Contrast ratio at 4 hours	1.8:1	3.5:1	6.3:1
Contrast loss	10%	3%	25%
Cool-down time	8 min	not necessary	not necessary
Brightness (foot-lamberts)	8.9	10.4	5.3
Flicker			
Reverse video		yes	yes
Multiscanning			
Size (inches)	15 x .75 x 11.38	12.63 x 1.25 x 12.38	12.88 x 2.38 x 12.63
Weight	4.5 lb	4.5 lb	6 lb
Carrying case	$39 soft/$139 hard	$69.95	$98
Video interface	on video-power cable	on video-power cable	on video-power cable
Video interface price	included	included	$99
VideoWorks animation	9 frames/sec	3 frames/sec	14 frames/sec
Interactive mouse use			yes
Power supply	uses Mac power	AC adapter	AC adapter
Power consumption		9 watts	11 watts
Power-cable length		10 feet	10.5 feet
Video-cable length	10 feet	6 feet	10 feet
Remote control			16-ft ADB cable
Warranty	1 year parts and labor	1 year parts and labor	1 year parts and labor

Features and Results Explained

Resolution

All the panels in this report copy the Mac SE and Plus/512K screens directly to the LCD panel for overhead projection. Only one panel, the Network Specialties Flat Top, offers higher resolution, allowing more information to be projected.

Fan

Overhead projectors emit a large amount of energy, which can heat up the LCD panels and cause them to fail. Failure is generally indicated by a loss of contrast in the image on the panel. A fan helps to keep the panel cool.

Air Filter

On all panels that use fans, an air filter is essential to keep dust out of the panel. If dust gets inside the panel and collects on the LCD itself, you'll notice it as specks on the projection screen. This can be fixed by opening the panel and cleaning the LCD with an appropriate cleaner or dry rag, but a filter will save you the trouble.

Heat-Reflective Glass

This is a special type of glass that some manufacturers place on the bottom of the panel to help keep the overhead projector from heating the panel.

LCD Type/Filter

Two display types are currently on the market: super-twist and double-twisted nematic (DTN). Super-twist is the technology used in current laptop computers and has a blue-on-white display. Some super-twist panels use a colored filter to improve readability and contrast. DTN is the newest LCD technology, with very high contrast, fast response time, and true black-on-white display.

Display Color

This is the color projected on the big screen.

Contrast Ratio/Loss

This indicates the white-to-black contrast ratio of the panel. The higher the number, the better the contrast, which makes it easier to see.

Contrast loss over four hours is noted as a percentage loss from the startup contrast ratio. A large contrast loss indicates that the panel handles neither hot rooms nor high-wattage projector bulbs well. Lower percentages are better.

Cool-Down Time

After the four-hour test, all the panels that did not include fans registered more than 110 degrees Fahrenheit, which we don't consider a safe temperature for packing up the display with all the papers in your

In Focus Systems PC Viewer 6448C + 2	Network Specialties Flat Top	nView MacViewFrame	Sharp QA-50
$2,795	$1,795	$1,695	$1,395
512 x 342	640 x 400	512 x 342	512 x 342
		yes	yes
		yes — internal	
yes		yes	
super-twist	super-twist	super-twist	DTN
yellow-green		green	
blue-on-yellow	blue-on-white	blue-on-green	black-on-white
4.1:1	2.2:1	1.9:1	10.5:1
3.7:1	2.1:1	1.9:1	6.8:1
10%	5%	none	35%
15 min	15 min	not necessary	not necessary
11.7	16.7	9.0	8.8
slight — during VideoWorks			
yes		yes	yes
yes — IBM PC, PS/2, Mac II			yes — IBM PC, PS/2
11.75 x 2.13 x 12.5	13.63 x 1.13 x 12	14.75 x 1.5 x 11.25	14.13 x 2 x 12.38
6 lb	4 lb	7 lb	7 lb
soft/included with panel	soft/included with panel	hard/included	not available
on video-power cable	SE/Mac Plus clip-on	on video-power cable	on video-power cable
$119	included	included	around $130
5 frames/sec	5 frames/sec	14 frames/sec	9 frames/sec
		yes	yes
AC adapter	uses Mac power	AC adapter	AC adapter
12 watts		18 watts	27 watts
6.5 feet		8 feet	12.5 feet
6 feet	6 feet	10 feet	6 feet
infrared			infrared
1 year parts and labor	90 days parts and labor	90 days parts and labor	1 year parts and labor

briefcase. We took the panel off the overhead projector after the test and timed how long it took to cool to 100 degrees Fahrenheit, which is warm to the touch — but not hot.

Brightness

This is the brightness of the image measured with a spot meter at the maximum contrast setting after four hours of use. The measurement is in foot-lamberts. This brightness was measured on a flat-white mat screen placed 8 feet away from the overhead projector. Higher is better.

Flicker

This is a notation of any flicker problems that we noticed during our tests.

Reverse Video

This is a switch on the panel that lets you switch back and forth between dark-on-light and light-on-dark displays. In some presentation situations, you may want to use reverse video to improve readability, and this is a good option to have.

Multiscanning

If you like to share, this will tell you what other kinds of computers you can use with your LCD projection panel. See the capsule reviews for price information on any extra video adapters you'll need.

Carrying Case

Carrying cases are a plus because you often won't have room for the panel in your already overstuffed briefcase. Also, cases specifically designed for these units offer better protection from breakage. Soft indicates a nylon cloth case, and hard refers to a foam-lined hard-plastic or metal case suitable for checking as baggage on an airplane.

Video Interface

Most video interfaces are installed in-line with the Macintosh power-video cable and require a clip-on wire to a resistor or pin somewhere on the motherboard. Only one display, the Flat Top from Network Specialties, uses a Mac Plus clip-on or SE bus card. Either way, dealer installation is recommended for all units.

Video Works Animation/Interactive Mouse Use

This is an indicator of what speed you can play VideoWorks II animation on the panel. At around 9 frames per second, the mouse is clearly visible for interactive use.

Power Supply
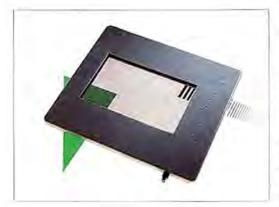
An AC adapter is one extra thing to carry around, so you might want to consider purchasing a panel that uses the Mac's internal power supply.

Power and Video Cable Length

Longer is better.

LCD Comparison

Network Specialties Flat Top

The Network Specialties Flat Top breaks the standard Mac screen-size barrier, displaying either the standard 512 x 342 pixels or 640 x 400 pixels. The latter resolution lets you display 46 percent more information than the other displays in this report.

Network Specialties
296 Elizabeth St.
New York, NY 10012
(212) 995-2224
$1,795

Flat Top, which uses a standard SE bus or Mac Plus clip-on card and comes with a Macintosh-opening tool.

Once the video interface for the panel has been installed, setup and takedown at each presentation take only a few minutes. You just plug the display into the Mac with a special video cable and power up the panel using an AC adapter. Of course, this is still a little more complicated than pulling acetates from your briefcase.

CONTROL TESTS

For this lab report we looked at eight LCD displays, which varied considerably in terms of both image quality and price. To provide a little perspective and a control, we included an actual acetate transparency in the tests. An old-fashioned transparency has a brighter picture and a contrast ratio that is twice that of the best electronic displays, at only a fraction of the cost.

We used a 3M model 213 overhead projector for all testing, and the temperature of the lab was kept within an 80- to 84-degree range. For all tests, 360-watt ENX bulbs were used. Brightness levels were measured in foot-lamberts using a Minolta spot meter. For reference, the average brightness of a movie theater screen is about 13 foot-lamberts. We projected the images on a flat-mat white screen with both the projector and the spot meter placed 8 feet from the screen.

Liquid crystals are heat-sensitive, so we gauged the temperature to monitor the effect of heat. We wanted to see how the display quality of each unit fared when we ran it long enough to "run a

temperature." In a real presentation situation, such as a trade show or a classroom, you might need to run your panel for a considerable length of time in a rather toasty environment with no air-conditioning. This is why we kept ambient room temperature between 80 and 84 degrees.

The feature most affected by temperature change in LCD panels is contrast ratio, which is the degree of contrast between the lightest and darkest portions of the screen image. Testing for contrast ratio was the most difficult and time-consuming of the tests we performed. The test screen we used was a SuperPaint document that contained large white and black rectangles. With the help of the spot meter, we adjusted the panel being measured to its maximum contrast setting.

First, we measured the contrast ratio using the spot meter and compared white brightness with black brightness. We kept the projectors turned on and let the units sit running the screen-saving program Pyro! for four hours, at which point we repeated the spot meter test. We measured the contrast ratio by turning off all light sources other than the test projector and pointing the spot meter at the white and dark rectangles on the screen. The Minolta spot meter had been adjusted to have the same sensitivity to light as the human eye.

Contrast ratio was recorded simply as the ratio of white to black, with 1 being the value for black. Our measurements differ significantly from the claims made by the manufacturers because their measurements are usually taken from the sur-

face of the LCD panel itself, rather than from the surface of the projection screen. Although they are much lower than the manufacturers' claims, our measurements reflect what the human eye actually sees on the screen.

Contrast was nearly twice as good using the new double-twisted nematic (DTN) technology as opposed to the standard super-twist displays. DTN technology also gives the appearance of being faster. That's because the DTN displays change from opaque to clear in the same time but with double the contrast change of a super-twist display. In addition, DTN results in a true black-and-white display image, which is both easier to read and what we've come to expect from a Mac display.

WHAT'S HOT, WHAT'S NOT

The Apollo Audio Visual, In Focus Systems, and Network Specialties units do not have internal fans, which puts them at a disadvantage to the other units. With higher wattage bulbs (greater than 250 watts) and hotter rooms (over 85 degrees Fahrenheit) you may find these units too hot to handle, and, as the panel heats up, you'll lose a significant amount of contrast.
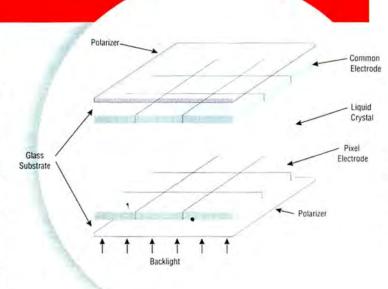
We measured the temperature of the top of the LCD panel after the four-hour contrast test. If it was more than 100 degrees, we waited to see how long it took to cool to 100 degrees, a safe temperature for handling and packing up. None of the units with fans had any problems. The units without fans heated up to around 115 degrees and then had to cool for about 15 minutes before they reached
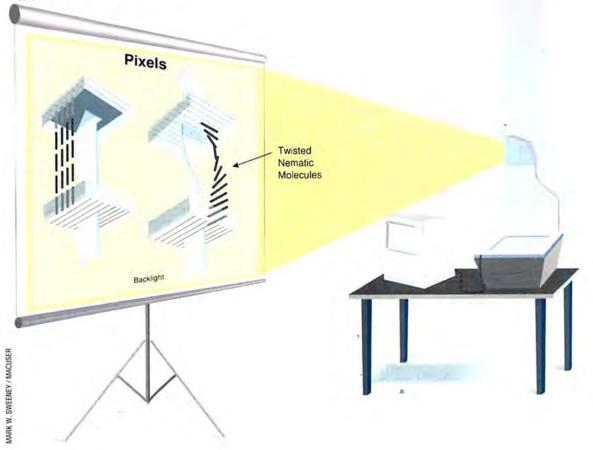
How It Works

Images on your Macintosh are displayed on an LCD panel that is projected onto a screen for an audience to easily view. While most LCDs in laptop computers use existing light to reflect images, these panels mask the light to project a positive image on-screen.

LCD panels have liquid crystals sandwiched between electrodes and polarizers. The electrodes form a grid of pixels, and the polarizers allow only light with correct polarization to pass through the filter. It is the liquid crystal that responds to electrical current and twists the light so that it can pass through the polarizing filters.

Liquid crystals possess characteristics of a liquid and a solid. Rod-like crystal molecules have properties that can control how light passes through them, yet they're still free-flowing like a liquid. Twisted nematic molecules are rotated 90 degrees from the electrode plane, allowing light to pass between the polarizing filter when the power is off. Providing power to the electrode at that cell untwists the light so that it cannot pass through the cell — creating a dot, or pixel. Other schemes rotate molecules 270 degrees and provide better contrast between the "on" and "off" cells.

Polarizer
Glass Substrate
Common Electrode
Liquid Crystal
Pixel Electrode
Polarizer
Backlight

Pixels
Twisted Nematic Molecules
Backlight

MARK W. SWEENEY / MACUSER

MacUSER LABS

LCD Comparison

nView MacViewFrame

The nView MacViewFrame was the best of panels and the worst of panels. Its contrast ratio came in at a dismal 1.9:1 — the worst of the lot. But it's excellent for interactive presentations. VideoWorks II animation ran at 14 frames per second — the fastest score.

nView Corp.
11835 Canon Blvd., Suite C-101
Newport News, VA 23606
(804) 873-1354
$1,695

100 degrees. Also, some units have heat-reflective glass, which reflects heat back to the projector rather than absorbing it. This helped keep temperatures down and contrast ratios up.

When items are moved around on the screen, ghosting and smearing are very noticeable on LCD panels (much more so than on monitors). The scan rates aren't as fast for LCDs because liquid crystals respond more slowly to electrical changes. We created an animation sequence in VideoWorks II (from MacroMind, Chicago) that moved six pointers across the screen simultaneously at various speeds. We wanted to see how well each unit displayed high-speed animation. The results indicate whether a panel can be used interactively or is suited only for frame-by-frame presentations.

Because the mouse moves so quickly, the Macintosh demands a fast-display response for real-time interactive use. This is especially important if you plan to hunt around in the Finder and double-click on things or play with an Excel spreadsheet during your presentation. If a panel is not rated as suitable for interactive use in this report, it's because the mouse disappeared whenever we moved it quickly. The displays that did not qualify as suitable for interactive use can still be used interactively, but you'll have to either move the mouse very slowly or periodically stop moving it to locate its position on the screen.

We also tested the geometric linearity of the panels. Macintosh pixels are square, so if the LCD panel's pixels are rectangular, your presentation will look squashed. To test for geometric linearity, we used Larry Pina's Test Pattern Generator. Fortunately for us (and for the manufacturers), all the displays in this report use square pixels, so squares were square on all the units tested.

LOW OVERHEAD

All the panels tested in this report are intended for use with a *transmissive overhead projector*. This is a standard overhead projector with a bulb in the bottom of the unit that shines light up through the transparency into the lens system and then onto a screen or wall.

Another type of overhead, called a *reflective projector*, uses a bulb that shines light from the lens box down to the transparency, where a mirror in the base then reflects the light back up through the lens. None of the overhead-display panels tested in this report work with this kind of projector.

If you're using a display that does not have a fan or heat-reflective glass, you should use a low-wattage bulb. Try to stay in the 200-watt range. LCD panels with internal fans can be used with larger bulbs, such as the 360-watt bulb in our test projector, but you should check with the manufacturer of the panel to see if you can use it with a particular overhead projector. In either case, be aware that keeping the units cool in warmer environments is more difficult. Read the instructions before buying, or ask your dealer about operating temperature ranges.

THE BOTTOM LINE

The main issues here are cost — after all, $2,000 is pretty steep for a box that does what a dollar's worth of acetates can do — and functionality. Unless you can use the animation, interaction, and real-time capabilities of the Mac, you won't be able to justify purchasing an LCD panel. When evaluating one, make sure that it can display animations and that it doesn't lose picture quality after a few hours on the projector. Another issue is durability. If a panel breaks the first time you sling it into the overhead bin on a 747, it's you who'll be sizzling, not the presentation.

As for adding sizzle, there's no doubt that using an LCD panel with your overhead projector to display a wild and woolly VideoWorks II animation will wow them in Peoria. The only question is whether it'll sell them as well. ∎

JEFF PITTELKAU IS AN EX–SKATE PUNK CURRENTLY SERVING TIME AS A SENIOR MATHEMATICS/COMPUTER SCIENCE MAJOR AT HARVEY MUDD COLLEGE IN SOUTHERN CALIFORNIA.

DIANE WILDE IS A MACUSER LABS TECHNICAL EDITOR.

Sharp QA-50

Sharp's QA-50 is a double-twisted nematic panel that, like the Flat Top, can switch between a standard 512-x-342-pixel display and a 640-x-480 display. The display is suited for interactive use and works well with VideoWorks II animation at up to 9 frames per second.

Sharp Electronics Corp.
Professional Products Division
Sharp Plaza
Mahwah, NJ 07430
(201) 529-8731
$1,395

MacUSER LABS

Winners and Losers

Sooner or later it had to happen. We had to decide what we liked best in overhead displays.

If you're looking for a no-compromises Macintosh Plus/512K or SE display, go for the Kodak Datashow HR/M. It has very good contrast and looks most at home with these machines. Its display speed is fast with minimal ghosting problems, and it is the most usable display for any type of animation or interactive use. It looks the most like the Macintosh screen, and that's a plus if you're a WYSIWYG devotee who won't tolerate a blue Mac screen. The built-in air filter keeps the unit from getting dirty over the long haul, and a super-quiet fan keeps it cool. The filter snaps off so you can change it quickly without having to open the unit.

Unfortunately, this unit has a serious problem with loss of contrast over time, losing 25 percent during a four-hour test. If you don't need to use it for extended periods, such as at a trade show, and if you can put up with the difficult and inelegant video-installation process, the Kodak model is worth a close look.
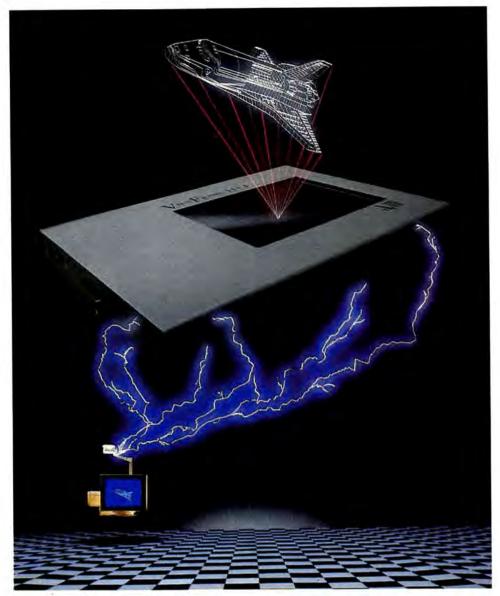
If you want a good, high-contrast display that you can use on any Macintosh (including the Mac II) as well as on the IBM PC or PS/2, take a look at nView's upcoming ViewFrame II+2. Although the unit was not shipping at

press time, we did have a beta unit to look at. We can't officially publish the test results because the unit i· a prerelease model, but first looks show that it has an excellent contrast ratio. Its high-speed display works well with animation. It also displays eight levels of true gray scale, or it will substitute patterns for colors. For $1,850, the ViewFrame II+2 may be one of the best multicapability systems for both the Mac and IBM worlds.

A display we cannot recommend is the Apollo PC 9500. It has no protective glass on the panel, and it looks as if it's just asking for someone to drop it and make a big mess. The instructions include a "what-to-do-if-it-breaks-and-you-make-a-big-mess" page that would scare those of us in the Labs away from purchasing this unit for our own use. Other units appear much more durable and offer many more features for the same or less money. The Apollo is a bare-bones Mac display with no perks, priced at $1,798 — too much for what it offers.

The In Focus Systems PC Viewer 6448C+2 has a 75-screen memory, which is a nice feature if you want to store screens in the unit and carry it to your destination. In combination with the remote control, this feature makes for a very intriguing unit. You can take electronic snapshots of spreadsheets, games, or anything else you see on the Mac screen. Press a button, and you've got a copy of it. Then press a button on the remote, and you can access it. Unfortu-

nately, this panel failed one of our key tests: It's too slow to be suitable for interactive use. Since this one has some of the most innovative features, we're hoping that In Focus will improve its interactive animation capability, possibly with a DTN panel, and lower the price ($2,795).

A good bargain is the Computer Accessories Mac Data Display. It's one of the least expensive displays in this report, and it offers good contrast. The internal fan keeps the contrast stable. Don't expect to use it interactively — it's a little on the slow side. But if all you want is a good, inexpensive panel for use with presentation software like PowerPoint, this is the display to buy.

The Network Specialties Flat Top unit offers a novel feature of 640-x-400 resolution on a Mac Plus/512K or SE, but it's slow and can't be used for interactive mouse work. One key feature is that it uses the SE expansion bus for its video interface — a slightly more intelligent and portable solution than the reengineering that most of the other units require. This panel also lets the most light through, even though it has a low contrast ratio. We found that it was a very readable display in situations with a lot of ambient light. A double–super-twist model was on display at the Macworld Expo in Boston last August.

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Winning Hearts and Minds (and Wallets)

by Freff

Music swims in a sea of perceived time; the music *business,* like all businesses, swims in a sea of perceived money. What you hear on the radio and see in the record store are tailings washed downstream from a mine in which trendily clothed gnomes swing pickaxes at raw talent in order to uncover glittering veins of cash.

How much cash? That's a tough call, the world economy being the neat, orderly, perfectly documented thing that it (cough) is. But average out the most reasonable high and low estimates of global music consumption and you land in a ballpark with 50 billion $1 seats. Reality check: This is 17 times the gross national product of Bolivia. It is equivalent to giving five Bruce Springsteen albums, at retail list, to every breathing soul in China. It is somewhat less than what advocates of Star Wars say should be spent on SDI research in the next two years. It is also more than enough to make Americans and American companies spend $6 billion annually on the instruments and recording gear necessary to keep the music mine open and producing.

$6 billion buys a lot of pickaxes.

Meet the Macintosh, pickax of the stars. "The computer of record where they make the records," as one Apple ad puts it, and it just might work out that way — if the intrepid folks in the Apple Music Marketing Group can successfully navigate their way between the Scylla of economic reality and the Charybdis of Apple's own deep-seated gall.

Our story so far. In January '84, Apple released a RAM-skinny little runt called the Macintosh. It didn't do a hell of a lot — yet — but it did it differently, and it did it in much cuter and friendlier a fashion than anything else with the last name Computer. Co-

incidently, musicians and recording engineers were coming to grips with a new development called MIDI, the Musical Instrument Digital Interface; a microprocessor networking system that vastly increased the power of electronic musical instruments. Musicians were terrifically excited by all the cool stuff they could now do that they couldn't do before. They were also filled with dread, the vast majority of them, and don't let revisionist historians tell you otherwise. Already reeling under the onslaught of new instruments, terms, and concepts, they abruptly found themselves face to face with The Dreaded Computer. Various technoids, more beard than bopper, had hacked together MIDI/computer interfaces.

The first primitive MIDI software was appearing at industry tradeshows and in hand-labeled plastic bags on adventurous music dealers' shelves. Although the usefulness of these new and protean tools was undeniable, so were

the headaches. More importantly — at least in any industry so driven by emotion and appearances — the most powerful computer then available was damned by the initials on its case: IBM. Big Blue meant big business, and if there is anything that everyone in music business vehemently denies, it is that they are in business. Back when Apple was advertising the Mac as the computer for the rest of us, and presenting executives as three-piece-suit lemmings, musicians were among the few who took the message very seriously.

Take that mix of receptivity and unsightly computer fear. Combine it with (1) the strength of the Mac's graphic environment, good for music notation and razzle-dazzle graphics that impress a market with a known weakness for flash, and (2) the fact that a high percentage of early Mac hackers were not only programmers but also frustrated musicians. Shake vigorously. Results? An intrigued and comforted marketplace, an aggressive if underfinanced clutch of Mac-based music software companies, and all the makings of underground success . . . within limits.

In the past year, Apple has publicly discovered the music market that third-parties have been developing since 1984. That it took so long is no criticism: Apple is a hardware company. To use an automotive analogy, they sell cars, not gasoline and road maps. Until a market proves, by itself, that it can move a lot of hardware off the shipping dock, that market justifies neither company attention nor resources. In 1987 Mac sales to the music market finally did justify serious consideration, and Apple insiders were able to pull together an industry-specific marketing effort. Ads began to appear. A catalog of available Mac and IIGs MIDI software was assem-

bled and distributed. A reasonably effective promotional video was produced. Music joined desktop publishing and desktop presentations among the ranks of sanctioned uses at the Macworld Expo. Apple swooped, like a diamond-studded hawk, on the crowds at both 1988 NAMM (National Association of Music Merchant) shows. The marketing group got 400-plus computer dealers to sign on as either Professional or Consumer Music Outlets, which meant convincing them to shell out hard cash to buy Apple-approved MIDI demo systems. And, finally, Apple bestowed coveted full dealerships to such major music outlets as the east coast's Sam Ash chain. All this action makes sense. There are those in the field — such as Joel Chadabe, president of the innovative software company Intelligent Music — who feel that music will ultimately be a bigger computer market than desktop publishing. "There are a lot more people who sing in the shower," Joel points out, "than will ever need to publish a newsletter."

Kudos to the entire effort. It looks good, it feels good, it sounds grand as hell, and it blows away the attempts being made by Commodore and Atari to pitch their own computers at the same market. With no more behind-the-scenes grousing than should be expected in a field that acts, most of the time, like a high school with money, The Apple Music Marketing Group has been doing their job just fine. What they didn't know when they began, they have either learned or shown that, given time, they almost certainly will.

If it weren't for the rest of Apple, things would be going great.

It's that five-letter expletive again: money. Apple is no more nor less greedy than any other company in existence, but their shortsightedness multiplies the negative effect. By pushing for a killing in major business markets they have effectively weakened — if not altogether strangled — their staunchest allies in developing markets such as music.

The first, and most obvious, problem is price.

"What would really help would be a

The Macintosh is an emotional favorite among many musicians, but the cold numbers indicate that it has only a 17 percent market share.

---

lower-cost Mac," says John Mavraides, of Mark of the Unicorn. "PC and Atari systems are much cheaper: A musician can get going for under a thousand dollars, while a Mac and a MIDI interface will cost at least $600 more."

This isn't opinion. It's fact. The Macintosh is an emotional favorite among many musicians, but the cold numbers indicate that it has only a 17 percent market share, compared with 22 percent for IBM or IBM clones, and 30 percent for various Atari machines. Michael Jackson can buy entire third-world countries, maybe, but your average starry-eyed musician must live within a paycheck. Even professional musicians who can afford any machine on the market are price conscious, if not entirely price driven, and Apple's steep price increases have pushed them toward other machines. (True, the price on the Mac Plus didn't change. But the Plus is a starter-level computer for musicians. Professionals tend to look past it and consider the SE and Mac II. Whose prices zoomed.)

The second, and more dangerous, problem is parochialism. Business markets are not homogeneous on the international scale. In each country they have their own flavor, their own eccentricities, their own unwritten rules. This makes it easy for a company like Apple to establish three or four geographical fiefdoms, administer them differently, and get away with it.

But the approach doesn't work with music, where there is a single large market that webs the entire world.

In Europe, Atari leads Apple 40-to-1 among musicians and recording studios. There are two reasons for this. One is the huge (and artificial) price differential between the two machines. There are people who make a healthy living selling gray-market Macs in Europe, underselling the official Apple Europe price even after buying the Macs at suggested list in America and paying all shipping, power conversion, and import fees. The other is that Apple Europe's marketing approach to the Mac out-blues Big Blue. To them the Mac is a business machine, plain and simple, and any hint that it could have some use outside a business context is a notion approaching blasphemy. Galileo had it easier with the Church than a French music software developer would have it with Apple Europe.

What does this mean to Mac music sales in the United States? Remember: Music is a single worldwide market. American Mac software companies that want to sell to European musicians have to port their software to the computer those musicians use, which is an Atari. Having done that, they also have to sell the program to American Atari owners — and having done *that*, they discourage American musicians from purchasing Macs. If the same software runs on both machines, why buy the more expensive one? Good question, and one with an overwhelmingly obvious answer on the sales floor.

You know what else? There's worse coming.

Apple's biggest problem has always been corporate arrogance. That arrogance leaves them ill-prepared to deal with their real competition in the music market, an economic force just now emerging from the wings. It's big, it's been in the music business for 100 years, it's Japanese, and the Apple Music Marketing Group is definitely David to its Goliath (maybe even David without a sling). In one word: Yamaha.

But we'll talk about that MIDI slugfest next time. ▨

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Macsimum DTP

The Seybold Desktop Publishing Conference, held in September in Santa Clara, Calif., demonstrated that the formerly estranged worlds of professional and desktop publishing are rapidly becoming one. Macintosh connectivity was at a premium, with numerous vendors planning hardware interfaces or software ports to bridge the gap between the Mac and everyone else (DOS, VAX, and Sun workstations, for example). Overall, the emphasis was on high-end products like color prepress systems and new PostScript typesetters.

QUALITY COLOR

Mac DTP'ers who long for commercial-quality color output will soon have a surfeit of choices, albeit pricey ones. Letraset and Crosfield Electronics announced the development of DeskLink, software that will convert Ready,Set,Go! 4.5 files into Crosfield's proprietary CPP page format. Completed pages — text and graphics — can be output as film separations. Unda simultaneously announced an interface between the Mac and its Color Design and Production System, a color prepress system based on the Sun386i workstation. Earlier this year, Quark and Scitex announced the creation of Visionary, which will connect QuarkXPress 2.0 to Scitex's widely used color prepress system.

Another newcomer was the Cyber-Chrome 36A Desktop Color Prepress Sys-

The CyberChrome prepress system can scan, edit, separate, and translate high-resolution color images for use with DTP programs on both Macs and PCs.
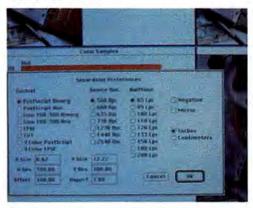
This month's DTP section offers a primer in color desktop publishing, including spot color and four-color separations. Between the Lines covers the fall Seybold Desktop Publishing Conference, including news on color prepress systems, new PostScript typesetters, graphics programs, and more.

In February, DTP will have an overview of gray-scale printing, the debut of our reviews section, plus news and tips. If you have a few tricks of your own to share, send them to DTP, c/o *MacUser*, 950 Tower Lane, 18th floor, Foster City, CA 94404.

tem, which has a 36-bit, 4,000-dpi color scanner that can handle slides, transparencies, and even objects. This $140,000+ system works with both Macs and PCs and outputs to any PostScript printer. Check with CyberPublishing, 5 Science Park Center, Box 9565, New Haven, CT 06536; (203) 786-5151.

Knowledge Engineering showed Color System I, an output system that uses the Ultre*Setter laser raster imager to produce four-color separations in under 20 minutes at a resolution of 3,000 dpi. The setup ($30,000 to $60,000) includes extensive support for typefaces from Compugraphic, Bitstream, and other third-party PostScript developers. Talk to Knowledge Engineering, 115 Mason St., Greenwich, CT 06830; (203) 622-8770.

SpectreMatch I lets you view the original and corrected images side by side on screen. SpectrePrint I's four-color separation capabilities include numerous options for file format, resolution, and screen frequency.

Meanwhile, Pre-Press Technologies announced an October release for Mac versions of its color-correction and -separation software, which has been available on the PC since March. SpectreMatch I ($3,000) can perform color manipulations on images stored in TIFF or PICT2 formats, while SpectrePrint I ($6,000) can convert the finished images into PostScript files for producing color separations on an imagesetter. Contact Pre-Press Technologies, 543 Encinitas Blvd., Suite 114, Encinitas, CA 92024; (619) 753-0194.

BEST OF THE REST

Other less spectacular announcements almost got lost in the shuffle. Adobe debuted Font Folio, a 45-megabyte hard disk

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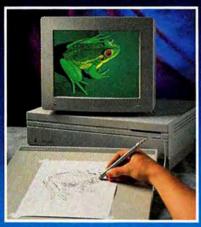
Desktop Publishing CAD/CAM/CAE Business Graphics
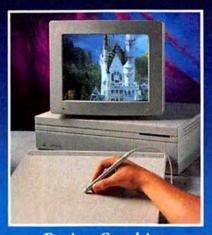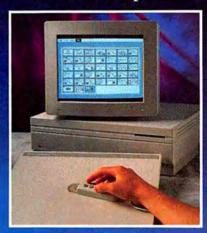
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Images courtesy of: Pagemaker from Aldus Publishing, VersaCAD, Powerpoint from Microsoft, PixelPaint from SuperMac Technologies, True Vision and Apple Computer, Inc.

containing its entire Type Library. For $9,600, the Adobe Font Folio will give your LaserWriter IINTX a font injection of more than 300 typefaces.

Quark performed the almost-unheard-of feat of simultaneously announcing and releasing a product. QuarkStyle is a collection of templates that provides "instant" desktop publishing for business communicators who don't have time to learn the niceties of layout and design. The 72 customizable templates — created by top graphic designers like the ubiquitous Roger Black — let the user concentrate on a page's contents rather than its appearance. The templates cover a broad range, including business cards, letterhead, envelopes, mailing labels, invoices, reports, catalogs, calendars, and newsletters. QuarkStyle ($295) also has a respectable word processor. For more information, contact Quark, 1983 Landings Drive, Mountain View, CA 94043; (415) 967-6796.
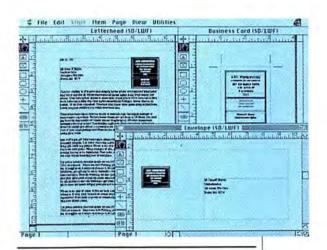
Newspaper editors should like News-Link, a text editor for the Mac II that lets you code text for transmission to an Atex system. The $495 program is available from Compatible Systems Engineering, 7630 Little River Turnpike, Suite 216, Annandale, VA 22003; (703) 941-0917.

The long-awaited Mac interface for the Barneyscan slide scanner was also shown. The box, which digitizes 35mm slides for use in graphics and page-layout programs, has been widely used in the IBM PC arena. It was expected to ship in early November with a price tag of $8,700. Contact Barneyscan, 1198 Tenth St., Berkeley, CA 94710; (415) 524-6648.
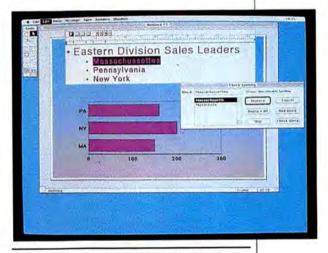
— Aileen Abernathy

Linotype Sets the Pace
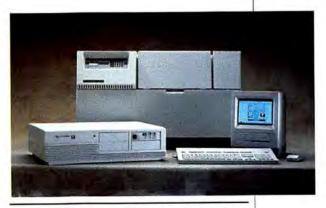
Perhaps the hottest news at Seybold was the new PostScript imagesetters announced by Compugraphic, Varityper, and Monotype. Feeling the heat, Linotype — long the lone player in the field of high-resolution PostScript output — showed it hadn't grown complacent from the lack of competition. The company came out swinging, debuting the Linotronic 200P, which replaces the venerable L100 as its low-end imagesetter. The new machine is 50 percent faster than the L100 and has a peak

QuarkStyle offers coordinated templates for those who abhor mismatched office supplies.

At Seybold, Cricket announced Cricket Presents 2.0, which adds a spelling checker, color blends, SYLK-format imports, and auto-kerning.

New PostScript imagesetters include Compugraphic's CG 9400PS, a 2,400-dpi unit that competes with Linotype's L300.

resolution of 1,693 dots per inch (dpi), compared with the L100's 1,270 dpi. The 200P comes in two flavors: a unit with a 20-megabyte hard disk ($28,950) and one with an 80-megabyte hard disk ($34,950).

Jazzy as the 200P is, however, it can't match the high-end L300 imagesetter ($65,000) in speed or resolution (2,540 dpi), nor can it produce halftones or color separations. For more details, contact Linotype, 425 Oser Ave., Hauppauge, NY 11788; (516) 434-2000.

Compugraphic surprised conference-goers with its announcement of the CG 9400PS imagesetter, a 2,400-dpi unit that competes with the Linotronic 300. Like the other Adobe-approved imagesetters, the CG 9400PS uses the Atlas version of Adobe's Raster Image Processor (RIP), giving it full PostScript compatibility. The $75,000 machine has an 80-megabyte hard disk that contains 73 PostScript typefaces, and it can produce halftones with up to 100 lines per inch and 129 gray levels. Contact Compugraphic Corp., 200 Ballardville St., Wilmington, MA 01887; (508) 658-5600.

Varityper stepped up to bat with two PostScript imagesetters, both scheduled to ship in early '89. The 4300P ($49,995) can print 2,400 dpi at 10 inches per minute, while the 4200P ($36,995) outputs 1,200 dpi at 15 inches per minute — compared with the 7.9 inches per minute of the Linotronic 200P at 1,270 dpi. Varityper can be reached at 11 Mt. Pleasant Ave., East Hanover, NJ 07936; (201) 887-8000.

Monotype previewed an external PostScript RIP for its Lasercomp series of imagesetters. The $19,500 RIP can be retrofitted on any Lasercomp, the prices of which range from $69,500 to $145,000. The PostScript RIP coexists with Monotype's own internal RIP, which means users can switch back and forth and use both companies' type libraries. The new RIP should be available in January '89 from Monotype, 2500 Brickvale Drive, Elk Grove Village, IL 60007; (312) 350-5600.

Finally, the first PostScript-clone imagesetters should be shipping as you read this. Itek Graphix is marketing the IGX 7000PS, a 1,600-dpi imagesetter that costs $39,995 and uses the PostScript-clone language created by Raster Image Processing Systems (RIPS). The BirmySetter, from Birmy Graphics, also uses RIPS' PostScript clone.
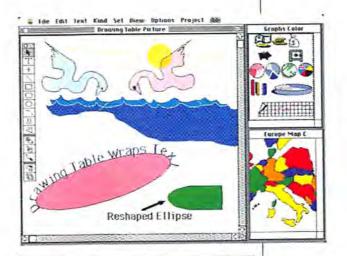
—Aileen Abernathy

Table of Contents

Broderbund's Drawing Table is a new object-oriented drawing program with a well-chosen set of capabilities, a comfortable, intuitive interface, and substantial picture power — all at a very reasonable price. Interface features include optional pre-highlighting of objects (to indicate what will be selected if you click,) good speed, rapid zooms, and an excellent set of tools for reshaping everything from freehand lines to ellipses.

Each editing tool can select and move objects and stays active until another tool is chosen. Multidocument prowess includes grouping sets of documents as projects and duplicating items by dragging them from one document window to another. It works in eight colors, which are pattern-ditherable into many more. It can bind text to a curved path and can import, free-rotate, and scale objects and text. It's an easily rendered $129. Contact Broderbund Software, Inc., 17 Paul Drive, San Rafael, CA 94903-2101; (415) 479-1700.

— Salvatore Parascandolo

Drawing Table's tool palette includes a couple of novel items. A duplicate tool, for example, lets you drag items from one window to another without cutting and pasting. The smaller windows contain clip art included with the program.

DTP

BETWEEN THE LINES

Graphically Speaking

Three popular graphics packages are getting feature injections that will give them more muscle. Aldus FreeHand 2.0, previewed at Seybold, has a well-rounded feature set, yet it can still run on a one-megabyte Mac. Its (namesake) freehand tool can now erase its path. There are new blend and auto-trace tools, a path-splitter, custom fill patterns, and the ability to capture an area and use it as a repetitive (tiled) fill. Improvements in text-handling include variable word and letter spacing, shadows, outlines, and fills. You can undo/redo your last 100 operations. It imports gray-scale TIFF images and can adjust their contrast and brightness. Files can be exported in color Encapsulated Post-Script Format (EPSF). The 2.0 upgrade is $25; list price remains $495. Contact Aldus Corp., 411 First Ave. S., Suite 200, Seattle, WA 98104; (206) 622-5500.

Version 2.0 of Silicon Beach's enormously popular SuperPaint still has only one draw and one paint layer, both black-and-white, but there are customizable document sizes, arrows, custom dashed lines, rotation of objects and bit maps, and eight-color preview. The major innovation is the concept of "plug-in" tools that can be programmed elsewhere and imported; their icons automatically appear in the scrolling toolbox. Tools included with 2.0 are a spiral maker, a paintbrush that runs dry during the stroke, and a three-dimensional rectangular solid. You can also auto-trace a bit map, producing QuickDraw or Bezier-curve outlines that can be exported to other applications. A SuperBits feature lets you work at any resolution. SuperPaint 2.0 is $199; registered users get it for $50. Talk to Silicon Beach Software, 9770 Carroll Center Road, Suite J, San Diego, CA 92126; (619) 695-6956.
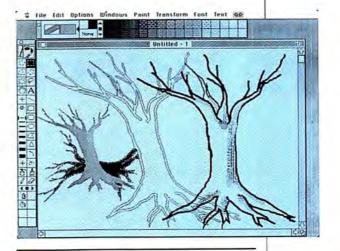
Letraset is developing ImageStudio Effects, optional add-on modules for advanced gray-scale–image processing. The first module has controls for rotation, scaling, transparency, drop shadow, and smoothing of selections. Another module lets you create and preview halftone screens, including the setting of halftone cell shapes and screen angles. Pricing was still undecided at press time. News flash: Two days after Seybold, at the Apple press

conference announcing the IIx, Letraset showed a pre-alpha ColorStudio, a color version of ImageStudio. Contact Letraset, 40 Eisenhower Drive, Paramus, NJ 07653; (201) 845-6100.

— *Salvatore Parascandolo*

FreeHand 2.0's enhanced toolbox includes an auto-tracing tool (lower left) for running circles, or any other path, around bit maps. The knife tool can split existing paths to simply open them, or to splice in other paths.

SuperPaint 2.0 now wields a smart auto-trace tool and can slant both drawn and painted objects. Its palettes are fully floatable and can be enriched with imported tools, which automatically appear in the blank positions.

Over the Rainbow

Grab Toto and click your ruby slippers — publication-quality color printing from the Mac is just over the rainbow.

BY
DIANE
BURNS
AND
S. VENIT

omniPAGE™

Like the opening scenes of *The Wizard of Oz*, the world viewed from the desktops of most publishers has been black and white and shades of gray. But recent releases from a variety of hardware and software manufacturers are freeing us from this drab gray reality, awakening us to colorful dreams as vivid as those that greeted Dorothy when she opened her door in Munchkin Land.

Many popular desktop-publishing packages now support color. For example, Page-Maker 3.0 prints spot-color overlays. QuarkXPress 2.0, Adobe Illustrator 88, and Aldus FreeHand offer full-process color separations and support the QMS Color-Script 100 printer. This 300-dpi thermal printer allows color proofing of PostScript files, although the colors it produces don't precisely match those that will appear on the finished page when it rolls off the press. (See "Here's Looking at Hue," October '88.)

Hit The Spot

In offset printing, there are two ways to produce colors on a page: spot color and process color. Spot color is usually simpler because it requires less advance preparation. The printer simply mixes the ink according to formulas given in Pantone swatch books and then loads the custom color on the printing press, along with a plate containing the image to be printed in that color. This method is often used to print a publication in only one, two, or three colors.

If the colors don't overlap, you can usually provide a single camera-ready version and tell the printer which elements are to be printed in each color (Figure 1). The printer will selectively block out parts of the page to make several printing plates from the same original artwork — one plate for each color.

The printer produces the finished page by running the paper through the press several times — once for each color used. For each color, the printer must clean the rollers and ink wells, load the next custom-mixed color, change the plate (to print different portions of the same page in the new color), and wait for each color to dry on the paper before running the sheets through for the next color.

This procedure is labor intensive and time consuming. Drying time alone can add days to a multiple-color print run done this

With publishing products like Illustrator 88, you can produce your own color separations on any high-resolution PostScript printer.

100% Pantone 206C (RED)

50% Pantone 206C (RED)

All other elements on the page will print 100% black
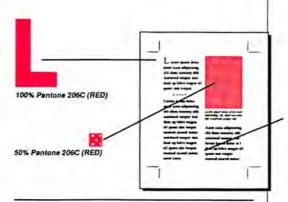
Figure 1. This sample page contains two elements of spot color: a solid letter and a screen. The printer would create two printing plates, one each for the black and red portions, by selectively blocking out portions of the page.
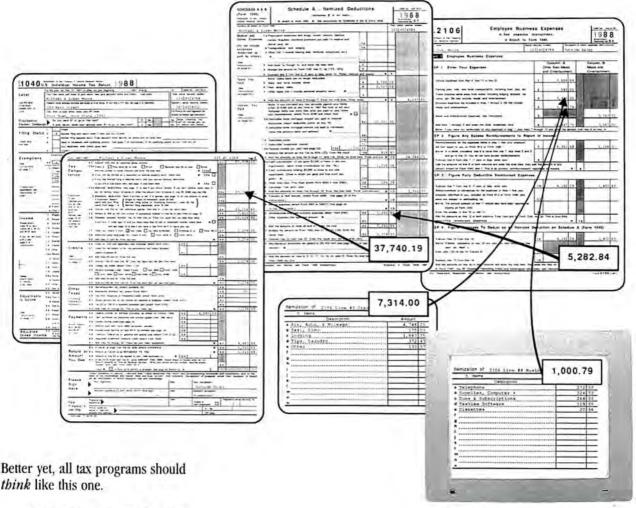
way. The waiting time is shortened when you use a press that can print two or more colors in one run — in which case industrial-strength dryers help set one color on a page before the sheet reaches the next set of rollers — but you still pay dearly for each color the printer has to mix and load on the press.

The Full Spectrum

If you want to print a more complicated color image, such as a photograph, spot color won't suffice. You'll have to use four-color process printing, in which an infinite number of colors can be produced by overprinting different-sized dots of the three primary colors of ink (cyan, magenta, and yellow) plus black. When you look at a four-color image, your eye is tricked into seeing the many colors that result from mixing the primaries. But if you magnify a color image from any newspaper or magazine, you can actually see the patterns of non-overlapping dots in four colors.

Process color requires a four-color press, which prints all the colors in a single run. The printer never needs to change the inks

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Figure 2. Artist David Smith created this Kimono in Adobe Illustrator 88 and used Separator to generate four-color separations for output on a Linotronic 300.

in the press, but the press still needs a different plate for each color — a total of four plates for each page. The process of producing these plates is called *color separation.* The original artwork is separated into four printing elements, each containing the dot pattern for one of the four colors.

In the past, you would simply hand the printer your full-color originals and let professionals with special cameras create the color separations for you. Now, with publishing products like Illustrator 88, you can produce your own color separations on any high-resolution PostScript printer.

Color Separated at Birth

Illustrator 88 ships with an auxiliary application, Separator 2.0, that produces four-color separations. Artist David Smith of Sausalito, CA, used Separator to send four-color separated, negative film to a print shop in Japan, where his Kimono was printed on a Linotronic 300 directly from the film (Figure 2).

The colors themselves were specified in Illustrator when the figure was drawn, by indicating percentages of cyan, magenta, yellow, and black (Figure 3). (Illustrator uses a similar technique to mix a "Custom

Color" for spot-color work.) Since the image was drawn on a Mac II with 8-bit color, the image could be previewed in color and some color adjustment could be made. The image was further proofed on a QMS Colorscript 100 printer prior to separation and printing on the Linotronic.

Adobe Separator makes the process of creating color-separated artwork as simple as printing a file. When you first open Separator, you must choose the file you want to separate and a printer type. Once these files are opened, you will see the Bounding Box, which defines the distance between the artwork and the registration and crop marks. In our example, we used the default settings. To increase the distance between the artwork and registration marks, you would merely increase the size of the Bounding Box.

After you finish these steps, one main dialog box enables you to make all the necessary selections for color separations (Figure 4). In addition to the standard page size and orientation, there are three other primary settings: Emulsion, Image, and Halftone.

The emulsion setting may be Up (Right Reading) or Down (Right Reading). The emulsion refers to the photosensitive side of the paper or film. Up (Right Reading) means that the entire image, including type, reads correctly when facing you. Down (Right Reading) means that the image, including type, is reversed, or a mirror image, when facing you. The rule is simple: Use Up when printing on paper, and use Down when printing to negative film.

When deciding whether to print a positive or negative image, consider what you'll do with the final artwork. If you're sending the separations directly to a print shop, you'll get the best results by printing a negative image to film, as opposed to paper, on the Linotronic typesetter. Since the plates for printing presses are photographed from a negative image, you eliminate a step by delivering negative film to your printer.

Finally, you must decide what frequency of halftone screen will be used to produce the color separations. The more lines per inch (lpi) the screen has, the smaller the dots will be. The decision depends on the paper and printer you are using for the final output. A lower lpi is used for newsprint to prevent smearing. Coated paper stocks, like those used in magazines, can produce excellent results at up to 150 lpi.
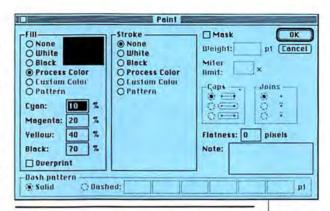
Figure 3. Illustrator 88's Paint dialog lets you create and correct colors using percentages of cyan, yellow, magenta, and black.

Figure 4. The main dialog box for Adobe Separator contains all the options necessary for producing four-color separations. Once you've made your selections, you can Print One separation in a single color or Print All four separations at once.

Figure 5. By clicking on Spot color overlays in PageMaker 3.0's print dialog, you can print separate sheets for spot colors, including cutouts.

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Color By Numbers

With color DTP approaching respectability, the litmus test for color applications has become "Yes, but can it do color separations?" Several programs besides Adobe Illustrator 88 have added four-color process separations to their repertoire; however, most are able to separate only their own files. Furthermore, the amount of control you have over the finished product varies considerably. Look for features like variable rotation angles and line screens, undercolor removal, registration marks, and the ability to manipulate and print each layer individually. Some programs to consider:

• **LaserPaint Color II** is probably the best of the bunch. It can produce color separations from any imported graphic format, including TIFF, PICT2, Encapsulated PostScript Format (EPSF), and bit maps. The program supports 24-bit color and the Pantone Matching System (PMS), and it has an extensive set of color tools for manipulating images. Separated graphics are saved in four files — one each for the cyan, yellow, magenta, and black layers. LaserPaint is the only program that lets you view individual separations — the magenta layer, for example — on-screen in order to tweak their color balance before printing. The $595 program comes from LaserWare, P.O. Box 668, San Rafael, CA 94915; (415) 453-9500.

• **PhotoMac**, as its name implies, can import color photographs as well as other images, all in 24-bit color. This image-manipulation program lets you perform many prepress tasks — including retouching, masking, and color correction — before creating four-color separations. Unlike LaserPaint, however, it does not allow you to color-correct individual separations on-screen. Avalon Development Group should have released PhotoMac ($695) by the time you read this. Contact them at 1000 Massachusetts Ave., Cambridge, MA 02138; (617) 661-1405.
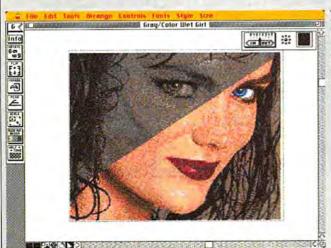
• **Modern Artist** 2.0 comes with a secondary application, ColorSep, that can produce color separations of any PICT or rPIC file (rPIC is Modern Artist's proprietary file format). The $495 Modern Artist has standard color-correction controls available, and ColorSep can generate three types of separations: a gray-scale proof, or a CYM (three-color) or CYMK (four-color) separation. Contact Computer Friends at 14250 N.W. Science Park Drive, Portland, OR 97229; (503) 626-2291.

• **PixelPaint Professional** can import most file formats, which are converted to color bit maps. These images can then be manipulated with a variety of sophisticated tools. Color separations are performed at 72 dots per inch (dpi), regardless of the resolution of the original image. This high-end, $595 version of PixelPaint has a November ship date; contact SuperMac, 295 N. Bernardo, Mountain View, CA 94043; (415) 964-9694.

• **FreeHand 2.0**, like the previous version, can separate its own files from inside the program. In addition to the usual controls for color and printing, each object within an image can have its own values for the rotation angle and line screen. The $495 program is available from Aldus Corp., 411 First Ave. S., Suite 200, Seattle, WA 98104; (206) 622-5500.

• **QuarkXPress 2.0** is the first page-layout program to handle 24-bit color and four-color separations. However, QuarkXPress can separate only its own graphics and those imported from Adobe Illustrator 88. Image control is limited to adjusting the contrast and color balance. (For a complete review of QuarkXPress 2.0, see "Change of XPression" in this issue.)

— *Aileen Abernathy*

This 24-bit image shows off LaserPaint's gray-scaling and color capabilities. The Goodies palette at left includes the scaling, cropping, and rotating tools used to prepare the image prior to four-color separation.

Optimum line frequency for the Laser-Writer is 60 lpi. On high-resolution Linotronic typesetters, you can print line frequencies up to 150 lpi, which is about the maximum density that offset printing presses can handle. The negatives for the Kimono were printed using a 150-line screen on a Linotronic 300 at 2,540 dots per inch.

Once you've selected the settings, a click of the mouse will give you a printout in a single color, in four color-separated sheets, or in a color composite. All printouts include crop marks, register marks, and color bars for the printer.

A Spot of Gold

Like Illustrator, PageMaker 3.0 lets you mix colors on-screen by indicating percentages of cyan, magenta, yellow, and black. You can also use the red, green, blue scheme, but we recommend sticking with the color model used by the world of offset printing.

PageMaker, however, *cannot* print the resulting color as a four-color separation; it prints spot color only. This means that you must print a separate sheet for each object or set of objects in a given color (Figure 5). All elements will be in perfect register on the final page. This capability makes it easy to prepare camera-ready film for most color printing jobs.

Using PageMaker's Cutouts option, you can print spot colors that border each other, one inside the other (Figure 6). This means the first sheet prints one color with the outline of the "fill" object cut out, and the second sheet prints the interior color. However, since these cutouts must butt each other exactly, without any overlap, this technique might not yield the most accurate results. You might end up with poor registration between the two colors, resulting in white spaces and color overlaps. Your printer might prefer that you provide separate overlays without cutouts.

A Rosy Future?

Programs like Illustrator 88 and Page-Maker hold great promise for color DTP, but grab your wallet before you put on the ruby slippers. Color printing is still an expensive proposition, even if you're spared the cost of making color separations.

If you've never worked with color before, it will behoove you to learn more about how offset printers produce color. If you already know a lot about color printing, you'll still
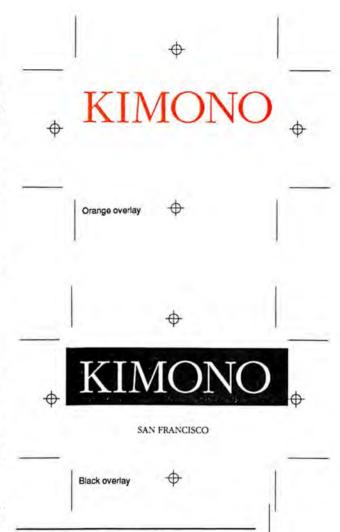
Figure 6. This spot-color cutout was created with Pagemaker 3.0 and printed as separate black and orange overlays.

want to test the results — separations, color keys, and printed publications — of these new products carefully to see how they compare with traditional color production methods.

Color on the Macintosh is in its infancy. Remember that many typesetting companies that scoffed at early desktop-publishing technologies have been left in the dust, so don't ignore the developments with color printing, or you just might find yourself back in Kansas — the black and white version — while the rest of us follow the yellow brick road. 🖼

DIANE BURNS AND S. VENIT ARE THE FOUNDERS OF TECH ART, INC., A DESKTOP PUBLISHING DESIGN AND PRODUCTION FIRM IN SAN FRANCISCO.

TIP SHEET

COMPILED BY GREGORY WASSON

FREEHAND

The Quick Clicks review of Free-Hand in the August '88 issue of *MacUser* faulted that program for not allowing outlined text to be filled with a shading. But there is, in fact, a way to *simulate* the appearance of filled, outlined text in Free-Hand without expending much effort.

First, make sure you've created the shading color you wish to use. Then select the text tool and create a text block specifying outlined format. Once you have clicked OK, go immediately to the Edit menu and choose the Clone command. This creates a duplicate of the first text block, right on top of the first one. Double-click to edit the cloned block. Make sure the text is selected in the resulting dialog box. Change the text effect box to read "solid" and change the color box to be your color choice (as defined at the beginning). Click OK, then immediately send that text block to the back. This trick works because outlined text in Free-Hand is transparent and lets the shaded text block show through.

CLARICE KEEGAN
SEATTLE, WASH.

Unless you know how to program in PostScript, the fill and line options in Free-Hand can quickly become boring. Expand your options by combining two FreeHand techniques with some ready-made Post-Script images — Zapf dingbats.

To convert any drawn line to a line of dingbats, use the "text on a path" feature. First draw the line, then choose the Text tool and create a single line of text at a small point size (6 point works well) that is longer than your drawn line. Select both your text block and the line you wish to convert and use the Join Elements command from the Element menu. That's all there is to it.

To use the characters from the Zapf Dingbat font as a fill pattern, use the "clipping path" feature. Create the area you wish to fill. Select the Text tool and create a block of text large enough to cover your fill area. Then, select the text block and use the Cut command to send it to the Clipboard. Select the area to be "filled" and choose Paste Inside from the Edit menu.

The same techniques will work with other fonts, but if they aren't PostScript fonts, they will print as bitmapped characters.

CLARICE KEEGAN
SEATTLE, WASH.

ADOBE ILLUSTRATOR

It's easy enough to take an object low in the painting order and bring it in front of everything else in Illustrator. But what if you want to bring it forward only so far — as if removing a playing card from a deck and inserting it closer to the top but not right at the top? If you cut the object and paste it in front, then you have to select all the other objects that are supposed to be in front of that object and move them in front to achieve the proper layering. Here's a simpler way.

Select the object you want to bring forward together with the forward object you want to move the first object right behind. Group them while they are both selected (Command-G). That's it. No cutting and pasting. Even if you Ungroup them, the layering change is preserved. The frontmost objects do not have to be tampered with.

BILL PLANEY
FORT WORTH, TEX.

PIXELPAINT

Here's a way to make PixelPaint cycle through colors on the palette to "animate" drawings. It's a great way to bring a picture of a waterfall to life or to make a daytime sky seem to pulse with clouds.

First, select the colors you want to cycle between. Do this by clicking the mouse on the color box and then dragging the cursor to the color you want. Then choose the second color.
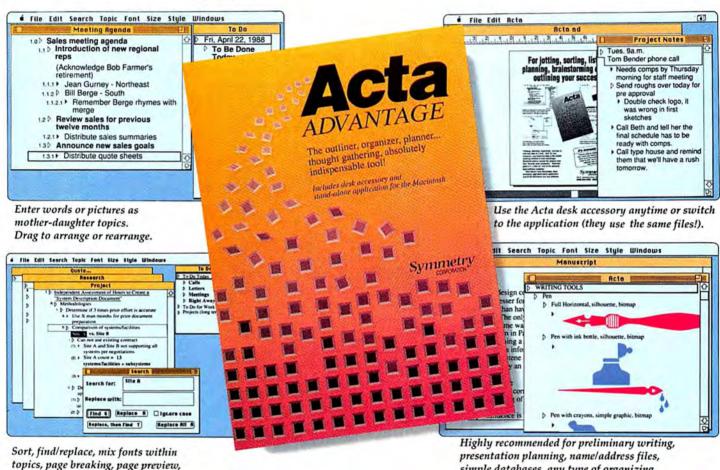
After choosing the colors, pick the selection tool, turn Caps Lock on, press Shift, and click the mouse button. To stop the cycling, click again.

This is quite spectacular

EASY ACCESS

The 5 key = the mouse button:
- Press once to click.
- Press twice to double-click.

Use the number keys around the 5 key to move the pointer in the direction of the arrows.

The 0 key **locks** down the mouse button.

The period key **unlocks** the mouse button

Figure 1: Easy Access, a utility that accompanies the Apple System software, primarily benefits disabled people, but sometimes it can help out applications "disabled" by missing features. Its movement control from the numeric keypad can be used as a "nudge" command in graphic programs that lack this feature.

if you copy a color Mandelbrot picture to the Clipboard, go into PixelPaint, and paste in the picture while in Special Effects mode.
STEPHAN LIESKE
LA CANADA, CALIF.

WORD 3.0

If you plan to type a sizeable portion of a document in uppercase text, it is wise to type under the All Caps character format (Command-Shift-K). Not only will you be able to check this text for spelling errors without deselecting the default Ignore Words in All Caps but you will also be able to change the text back to the format of normal lowercase with proper nouns and first words of sentences capitalized (if you still use Shift while typing) simply by removing the All Caps attribute.
BILL PLANEY
FORT WORTH, TEX.

If you are accustomed to using the fi and fl ligatures (Option-Shift-5 and Option-Shift-6, respectively) in your work, you will save time running the spelling checker in long documents by replacing the character pairs "fi" and "fl" with the ligatures *after* the spelling checker is finished. The spelling checker does not recognize these as alphabetic characters, and you cannot add words that contain them to user dictionaries. If you put the ligatures in prior to the spelling check, the spelling checker will regard the remainder of any word containing a ligature as a

misspelled word, unless in that instance those characters happen to match a word in the Main Dictionary (such as the "re" in *fire*). When you are ready to replace the characters with their appropriate ligatures, go to the beginning of the document (Command-keypad 9), open the Change dialog (Command-H), set replacement parameters, select Match Upper/Lowercase, and click Change All.
BILL PLANEY
FORT WORTH, TEX.
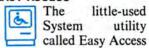
The footnote command in Word 3.0 is very useful, but it suffers from some severe limitations. Structures like " . . . can be found in several review articles 1–12" are common in scientific literature but are difficult to create using Word's footnote command. But using the hidden text feature allows for the creation of such structures easily. While typing a manuscript, use the footnote command to enter all the footnotes. Separate the first and second footnote numbers with a hyphen (or en-dash) and separate the rest by commas. This creates a list of reference marks that display as " . . . can be found in several review articles 1–2,3,4,5,6,7,8,9,10, 11,12." Next, select the second through the next-to-the-last numbers, including the last comma (in this example, "2 through 11,"). Format the selection as Hidden Text, using the Character command under the Format menu or by typing Command-Shift-X. The modified sentence will dis-

play and print as " . . . can be found in several review articles 1–12" when the Show Hidden Text option in the Edit Preferences dialog box is *not* selected.
MARK JONES
BOULDER, COLO.

FINDER

When a folder is shown by name, date, or kind, many users feel compelled to double-click or drag a file by the itsy-bitsy icon on the far left. Even though this works just fine, it's unnecessarily precise and can slow you up. You can, in fact, click or drag a file anywhere in the row (including the white space after the name). If you're double-clicking, however, avoid the name column because two clicks there makes the name edit-

able and puts an insertion point where you clicked.
DAVE VALIULIS
SCOTTS VALLEY, CALIF.

EASY ACCESS

The little-used System utility called Easy Access was meant primarily to aid physically impaired Mac users who had trouble using the keyboard and the mouse. But any user can profitably use the utility from time to time. For example, using the Mouse Keys function of Easy Access, you can easily implement a "nudge" command, which moves a selected object one pixel at a time in any direction. Such a command exists in SuperPaint and Cricket Draw but is sadly lacking in many other draw programs — like Free-

MAP
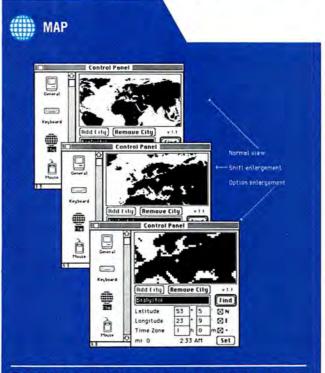
Figure 2: Zooming in on the world! There are actually three views possible in Apple's new Map cdev, not two as documented.

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NetModem
—by Shiva

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Hand. Here are the steps:

1. Make sure Easy Access is in the System folder when you start (or restart) your computer. You have to be using System 4.1 or later.

2. Open your draw program and position the pointer over the item you want to nudge. Click the item to select it.

3. Press Command-Shift-Clear to turn Mouse Keys on. With Mouse Keys on,

the numeric keypad operates as a mouse substitute.

4. Press the keypad's 0 key to lock the mouse button down. (This is an electronic locking, not a physical one.)

5. Tap any of the keys surrounding the 5 key to move the selected item exactly one pixel in the direction specified by the position of the key. For example, the 2 key moves the item straight down, the 8 key

moves it up, and the 6 key moves it to the right.

6. When you've nudged the object into place, press the keypad period key to unlock the mouse button.

You can leave Mouse Keys on as long as you don't need to use the keypad for regular input (the Enter key is unaffected by Mouse Keys, however). To turn Mouse Keys off, press Clear on the keypad.

Mouse Keys can be incredibly useful for very fine mouse movement — and it's lots of fun once you get used to it. See Figure 1 for a full schematic of how you can control the pointer using Mouse Keys. [*For a full-length discussion and explanation of Easy Access, see "Open Door Policy" in the February '88 MacUser. — Ed.*]

FRED WAINSCOTT
SPOKANE, WASH.

TIP OF THE MONTH

READY,SET,GO! 4.0

Okay, you graphic-design fiends — get ready (set, go) for this one. Ready,Set,Go! 4.0 can easily wrap text around an imported graphic, right? Well, you can also wrap text *within* two graphics to create interesting paragraph shapes such as circles, triangles — just about any shape your twisted mind can come up with. Here's how to do it:

Draw the shape that you want the text to conform to using a drawing program like MacDraw. The trick is to draw it in two halves (such as two half moons that together would form a circle). Copy and Paste each half of the drawing separately into the Scrapbook.

Now go into Ready, Set,Go! 4.0 and create two graphic blocks large enough to accommodate your drawings. Butt them up against each other. Paste your two graphics into these graphic frames — the left half into the left block and the right half into the right one. The

two halves should now resemble the graphic shape you want. Call up the Specifications box (Command-M) for each graphic block and click Don't Print and Runaround Graphic (as opposed to Runaround Frame).

Next, create one text block as large as the two graphic blocks. Make sure the text block lies directly on top and covers those blocks.

Put your insertion point in the text block and start typing or import a text file. It will take on the shape of the two graphics.

Use justified text if you want the text to conform exactly to the shape you've created. And set text repel distance to zero.

If you have problems getting the text to flow correctly into the shape, try drawing nonprinting lines above and below your graphic while in RSG! 4.0. This should solve the problem.

DAN KAUFMAN
NEW BRUNSWICK, N.J.

MAP

The Apple documentation on the Control Panel Map utility mentions that if you want a magnified map image, you should press the Option key while clicking the Map icon. This results in an image that's so magnified as to be virtually unusable. What the manual doesn't mention is that you can get a slightly magnified version of the map by pressing Shift while clicking the Map icon. The three possibilities are shown in Figure 2.

SCOTT SPARSHOTT
SANTA CRUZ, CALIF.

The world map image in Apple's new cdev Map can be copied to the Clipboard simply by choosing Copy from the Edit menu when Map is on-screen. Make sure the

Figure 3: Your world doesn't have to be in drab black and white. The map in the new Map cdev can be colored to your heart's desire.

city name box is not highlighted (or you will copy the name instead of the map). So what's so great about that? Several things.

First, if you have a color system, you can copy and paste the map image into a program like PixelPaint, color it, and then copy and paste the colored version back into the cdev's window. Oceans could be blue, continents in contrasting colors, and so on. (See Figure 3.)

If you live in a black-and-white world, you can still modify the map in Mac-Paint, using patterns instead of colors.

And in any case, you have a fairly decent world map that you can store separately with your clip art for use in other documents.

And, by the way, you don't have to worry about cutting or clearing the map image accidently — only Copy and Paste work from the Edit menu while you have the cdev open.
DANIEL STINSON
TUKWILA, WASH.

PAGEMAKER 3.0
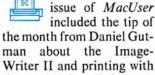
The new AutoFlow and Text Wrap abilities of Page-Maker 3.0 are great, but things can become tricky if you want to wrap text automatically around a graphic, then put a caption below or next to the graphic. Ordinarily, the text being wrapped will flow right over any caption placed below the graphic.

The solution is to increase the "stand-off" value of the text wrap around the graphic on the side where you want the caption. But there is a trick to this. If you're not

careful, the Text Wrap area of the graphic will push the caption away, leaving it stranded right in the middle of the wrapped text again.

You must make sure that all the handles of the text block defining the caption are *inside* the Text Wrap area. To do this, you must place the text or begin the text block by dragging the text cursor, rather than just clicking. Clicking forms a text block the width of the column or page, which usually makes it larger than the Text Wrap area — the result is that PageMaker will push the caption away. By dragging, you can be sure that the text block of the caption begins and ends inside the wrap area, so it will stay where you want it.
CARL ARON
ELLICOTT CITY, MD.

IMAGEWRITER II

The September '88 issue of *MacUser* included the tip of the month from Daniel Gutman about the Image-Writer II and printing with the machine's built-in near-letter-quality font. It's a great tip, but there's an easier way to coax near-letter-quality printing from the ImageWriter II.

Rather than using Res-Edit or MacTools (we're not all hackers!) and the Print Merge function of Word 3.0, simply select draft mode when the print dialog box comes up on the screen. Then, using the selection switches on the printer, select the typeface that you'd like to use in near-letter-qualify mode (check your ImageWriter II manual for details on how to select the

various choices). It's a snap and works like a charm. [*The same tip was sent in by two people on the same day. — Ed.*]
MARTY SILBERNIK
BUFFALO GROVE, ILL.
and
MARK JOHNSON
PROVO, UTAH

MOEBIUS

Moebius is a great new game of the Ultima III adventure role-playing type with an added twist: a martial arts motif. But, there is one aspect that probably will cause frustration. Before you start a new adventure, you must train every new character in armed, hand-to-hand, and magical combat with a special "zoom view" à la Ancient Art of War (see Figure 4 for a typical scene of a training session). This takes time. If your character is killed later in the game (and your extra lives are all used up), he or she is gone for good since you cannot revert to an ear-

lier version at this point. But there is a workaround.

Once you have a character trained and have started the adventure, save and quit the game. Open up the folder with the game in it, View by date, and copy all the files with the current date on them (they'll be at the top of the window) to a separate disk. Then when your alter ego bites the dust, copy these backups back into the game folder. Your character will be alive again and you won't have to go through the hassle of creating and training a brand new "disciple." You can simply reenter the adventure, possibly enabled now to avoid the mistakes that got you killed in the first place. You can save these files again when your character has later advanced to higher levels of experience, wealth, and food, so that you can always restart at the peak of his or her status should a mishap occur.
GEORGE WEBER
SANTA MARIA, CALIF.

Figure 4: Newly created characters in the game Moebius must undergo arduous training before embarking on the main adventure.

HYPERSPACE

Hyperspace is expanding. Look for an old friend, *The Macintosh Bible*, in new dress in Hyperspace news, and find the HyperCard how-to video. We've also included reviews of Organizer + and HyperX. And Michael Swaine presents the Famous GrammarTester Hypertext Trick.

"The Word" is Out

The Macintosh Bible by Dale Colman and Arthur Naiman, originally published in 1987 by Goldstein and Blair with "thousands of basic and advanced Tips, Tricks & Shortcuts," is now available in — you guessed it — HyperCard! With the introduction of *The Macintosh Bible: STAX! Edition*, STAX! welcomes you to the "real world of Electronic Publishing," where paper is the least important output. It's one of the first complete books available on disk.

The electronic version follows the biblical analogy with its five scrolls (corresponding to the five sections of the paper version) and a table-of-con-

Application Programs			
♦ **Word processing**		♦ **Communicating**	
• General tips		• Communicating with MS-DOS	
• MacWrite tips		• TOPS PCs-to-Macs	
• Word tips		• MacServe Mac-to-Mac	
• WriteNow tips		• MacMenlo & Tandems	
• Tips about More		• MacTerminal • Red Ryder	
♦ **Number crunching**		♥ **Special CATegories**	
• Spreadsheets • Databases		✿ Very Hot Tip	
• Excel • Multiplan • File • Wks		△ Important Warning	
• FileMaker • Helix • OverVUE		O Shortcut	
♦ **Graphics**		⚐ Very Good Feature	
• MacPaint • FullPaint		♀ Very Bad Feature	
• MacDraw • MacDraft • Digitize		$ Bargain	
♦ **Desktop publishing**		☞ Gossip/Trivia	
• PageMaker • Ready,Set,Go!		⚘ Things to Come	
		▦ Hyper Picts	
		♪ My Notes	

Choose Applications from the Scroll Rack for the contents of the "scroll."

tents stack containing the five scrolls on a Scroll Rack. It provides all the information management capabilities of HyperCard for moving easily through the book. In a word (or a few), a good thing has been made better.

The Macintosh Bible: STAX! Edition comes on three disks. The package includes a reference manual and a paperback copy (they haven't completely eliminated the paper) and sells for $79.95. It requires a Mac with at least 1 megabyte of RAM, two 800K disk drives, and HyperCard 1.0 (or later).

STAX! is located at 8008 Shoal Creek Blvd., Austin, TX 78758; (512) 467-4563.

— Laura Johnson

Speaking In Tongues

Shades of the 21st century! Hyper-Animator by Bright Star Technology is a random-access animation tool for speech synchronization used to create talking heads sans David Byrne. Talking Tiles, based on HyperAnimation Technology, teaches reading and spelling by means of "synthetic actors," letter tiles with corresponding sounds and mouth movements. Script, sign language, and European versions are currently in the works. HyperAnimator sells for $149.95; Talking Tiles, for $129.95; and HyperAnimator Stack Sets — five HyperCard applications using HyperAnimation Technology — for $59.95. For more

See Mac speak. Click on a letter of the alphabet for the sound of the letter and corresponding mouth movement.

information, contact Bright Star Technology at 1003 111th Ave., Bellevue, WA 98004; (206) 451-3697.

—Laura Johnson

I f you're still not exploring HyperCard, here's your ticket to the excitement.

Welcome to the Club

Feeling left out? Are you wondering what all the fuss was about at the Macworld Expo in Boston when Apple celebrated HyperCard's first birthday?

Lots of people are having fun with HyperCard, but many more don't know what it's about or how to use it. If you're still not exploring Hyper-Card, here's your ticket to the excitement. Pick up a training manual or videotape like "HyperCard, Getting Started" from Voice and Video. Pop the cartridge in your VCR, start up your Mac, and sit down to a friendly and informative introduction to HyperCard.

The first thing you see on the "HyperCard, Getting Started" video is Chuck Allen, who could be the guy

next door or your helpful computer guru. He begins by showing you a number of real-life items: an address book, a calendar, a Rolodex, an appointment book, and a to-do list. Then he shows you their on-screen equivalents in HyperCard.

As you follow along, you design a simple stack that you could use every day to capture notes. You also copy buttons (it's almost as easy as copying text), make new buttons, and create a simple script that launches you back to your notes with a mouse click. In addition, Chuck will show you how to come up with ideas for your own personalized stacks. After 100 minutes of viewing, you could consider yourself a card-carrying member of the Hyper-Card club.

Welcome to the club.

For further information, contact Voice and Video, 5038 Ruffner St.; San Diego, CA 92111; (800) 621-5640, then 353497 after the tone; or (619) 560-1166.

— Gil Davis

Organizer +

You can't find a hotter software category than the Personal Information Manager (PIM). They're sweeping the MS-DOS community and, thanks to HyperCard, making inroads on the Mac.

PIM-type software has been available on the Mac since 1984, but the early stand-alone programs had as much going against them as they had going for them. Most were cursed with copy protection, something absolutely unacceptable on vital everyday productivity software. And while they had reasonable feature sets and could import and export to databases, none really caught on.

Then came HyperCard. Following close behind came Focal Point, the first real HyperCard productivity application. Soon the shelves and electronic networks were filled with PIM-type stacks.

Some are pretty good; others are downright awful. Virtually all of them, including Focal Point, suffer from a common flaw: They run on a

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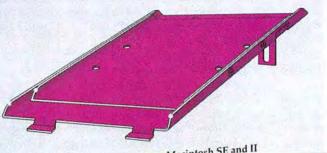
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UniMac StörWare™ Help Window automatically Changes
as you move the pointer from button-to-button

SCSI Address	0	Interleave	3
1 MiniScribe	43
2 MiniScribe	347
3 Quantum	40
4 Quantum	80
5 CDC	150
6 SeaGate	60

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Mac, but they aren't really computer programs. They just exist on a computer. Their data comes from the outside and is meant to be used outside computers. They are electronic simulations of Filofaxes and Day Runners. But they lack the one thing that makes Filofaxes and Day Runners useful: portability.

Organizer+ is different. It's a PIM stack, but it recognizes that it exists on a computer, and it seeks to make the user a more efficient computer user. To that end, Organizer+'s main screen (actually one of a linked group of stacks) is a superb document and application launcher. It is in the main screen that you can live all day — checking your schedule before launching a word processing document. The main screen allows up to 10 pages, and each page has two scrolling windows where you can place application and document names. There's so much space available that you shouldn't ever have to

scroll these windows, but you can if necessary.

There's also a well-designed address book with plenty of room for names, notes, keywords, and alternate phone numbers. The calendar is adequate. Its biggest drawback is that the individual days are divided into hourly periods that can't be further subdivided. The Project and To Do sections are also well-designed; they serve their purposes.

There's some linking between stacks, but in general, you have to enter the same information into several stacks. Focal Point is better at avoiding reentering, and the upcoming Focal Point II goes out of its way to avoid it.

For general information, there's a good Notes stack. For data that is tied more closely to other material, you have the option throughout Organizer of using a pop-up note. The Notes stack is better for material that you expect to manipulate — it's really

a small, free-form database — while the pop-ups are good for reminders.

There are also PhoneLogIn and PhoneLogOut stacks that work in conjunction with the address book's auto-dialing feature. These record the duration of phone calls and also allow you to keep good records of your conversations.

The manual is brief (a more complete one is promised with the next version), but as is, it's adequate. There's also detailed on-line help.

It's possible to print out most of the information in Organizer+, but producing hard copy is not its primary purpose. What Organizer+ does, and does well, is let you keep track of your contacts and obligations while enabling you to use your Mac to the fullest.
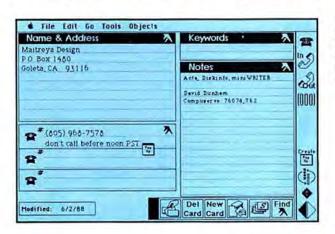
— John Langston

HyperX

HyperCard has unleashed new ideas faster than any other programming medium. Many applications that were once erected only in C, Pascal, or Assembly Language are now appearing in HyperCard. Expert systems are one area of increasing excitement in the traditional language arena. HyperX adds an expert system shell to the HyperCard environment.

Like most expert system development tools, HyperX allows a human expert or knowledge engineer to translate skills about a human endeavor into computer readable form. This process, known as knowledge engineering, is accomplished by translating English sentences into a syntax that can be understood by an expert system shell. HyperX speaks a subset of English called Attribute-Value (A-V) pairs. If you want to assert that "The machine is turned off," you would write a rule that contained the A-V "Machine, turned off". In this case "Machine" is the object and "turned off" is the attribute associated with that object. This simple translation technique makes writing rules in HyperX very simple.

In addition to creating knowledge bases, this 51K stack allows a knowl-

The phone book features in Organizer+ allow auto-dialing and even keep a log of your calls and their duration.
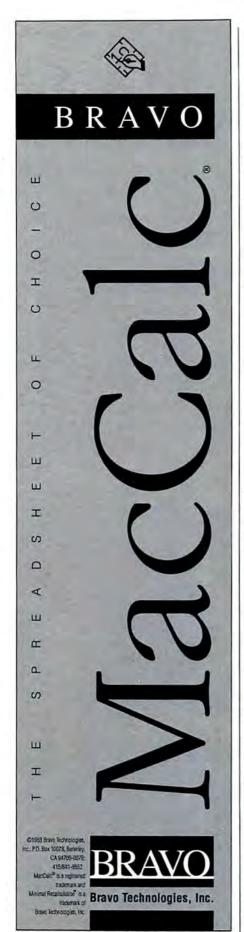
The knowledge base in HyperX is built using a simple subset of English called Attribute-Value pairs. In this example, "Operating Expenses" is the object, and "may be excessive" is the value.

edge engineer to build customized questions that relate to an attribute. These question cards can use the full graphic environment provided by HyperCard. The ease with which HyperX creates a user interface puts existing expert system products to shame.

Using HyperCard as a delivery vehicle does have its disadvantages. The most noticeable is that it's slow. As long as HyperTalk remains interpreted, building fast systems is impossible. Also, because HyperCard does not make use of color or large-screen monitors, delivering a HyperX system on a Mac II is anticlimactic.

HyperX is best used to teach the fundamentals of expert systems. The on-line tutorial walks the uninitiated through such terms as forward and backward chaining. While running an inference, you can click a button that forces the system to show you what it is working on. A complete line of reasoning is available after each inference for those who want to verify the result. For high school or college students interested in an inexpensive introduction to expert systems, for example, HyperX is a good buy.

For advanced users willing to take HyperTalk into their own hands, HyperX also includes the insidious AI technique known as *demons*. Demons are pieces of programs that are invoked to help determine the value of an object. Demons are created within the script of a question card.

Because HyperX is delivered in an unprotected stack, you not only get to see what an inference engine looks like, but you can be brave and add features to the system as well. Real HyperCard hackers might want to add frames or other more advanced expert system techniques.

HyperX is accompanied by a 40-page manual that covers most of the key points. I would like to see the next manual include an index and an explanation of how to import rules from text files. The best way to learn HyperX, however, is to explore some of the very-well-thought-out example rule stacks. One stack on financial analysis opens an ASCII text file and processes the information. HyperX

could find a powerful niche in the front-end stack market. Stack formation developers could include HyperX in their offerings as an intelligent way to focus stacks and eliminate haphazard browsing.

I like HyperX. I will probably never build a commercial expert system in it, but when somebody asks me, "Hey, what does an expert system do?", I'll bring up HyperX to show them not only an expert system, but the promise for the future of hypermedia. The information explosion has bred a new requirement for technology to manage technology. When the *Wall Street Journal* and the *World Book Encyclopedia* are available as stacks, we will all need tools like a HyperX knowledge base to separate the wheat from the chaff.

— Dan Rasmus

Organizer +
♦♦♦½

List Price: $35
Published by: Dazzl, 2 Chandler Court, Columbia, MO 65201; (314) 874-8657.
Version: 1.1
Requires: 1 megabyte and HyperCard.
Compatibility: Mac II and MultiFinder friendly.
Application Size: 556K without files.
Copy Protection: None

HyperX
♦♦♦♦

List Price: $49.95
Published by: Millennium Software, 1970 South Coast Highway, Laguna Beach, CA 92651; (714) 497-7439.
Version: 2.0
Requires: 1 megabyte and HyperCard. Hard drive is recommended.
Compatibility: Mac II and MultiFinder friendly.
Copy Protection: None

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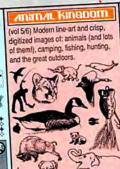
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SPECIAL OCCASIONS
(vol 7/8) ✳ Turn-of-the-century: holidays, seasonal, religious, children, music, dance, food and feasting.

INDUSTRIAL REVOLUTION
(vol 11/12) ✳ Turn-of-the-Century: machines, professions, business, characters, expressions, the old west.

ISLAND LIFE
(vol 15/16) Hawaiian and Australian: animal life, tropical vegetation, trade-marks, and leisure activities from hula dancing and surfing to camel riding.

MacUser gave WetPaint 5 mice (Sept. 1987) saying " ...the WetPaint art is almost a must for clip art users; the ArtRoundup desk accessory is a neccessity." Volumes marked with ✳ were previously released as "MacMemories."

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MacUser gave World Class Fonts! 5 mice (Dec. 1986).

Volume 1/2
The Originals

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DUBL-CLiCK

Another Adventure of the Borrowers

by Michael Swaine

This column's purpose is to explore projects in HyperTalk programming. HyperTalk, of course, is the programming language of HyperCard, Apple's software product; its creator, Bill Atkinson, calls it a software erector set.

Probably nowhere does the erector set metaphor seem so apt as when you play with HyperCard's ability to link objects together — stacks to stacks, cards to cards, fields to fields. The structures you can build in this way, though, soon outrun Atkinson's metaphor, bound as it is by the constraints of mere three-dimensional space. Try modeling in three dimensions the picture-to-picture linkage of the Clip Art stack that Apple supplies with HyperCard.

This ability to link elements of text, graphics, and sound into a new, nonlinear kind of composition was named *hypertext* by its inventor, the visionary Theodor Holme Nelson, about twenty years ago. (But you must refer to him as Ted Nelson to be among the cognoscenti. HyperTrivia item: The Holme part is for his mom, actress Celeste Holme.) It is from Nelson's hypertext that HyperCard inherits half its name. Atkinson stopped short of giving us the "Holme stack," and for that I think he deserves our respect and gratitude.

This month's HyperTalk programming project falls into the category of hypertext tricks. There are a lot of these hypertext tricks. There's the famous BMUG trick, the famous Waite group trick, the famous Steve Drazga trick, and so on. What they are all designed to do, aside from bringing fame to their creators, is allow you to build and use hypertext-like links among HyperCard objects.

I developed my hypertext trick in the course of writing last month's script, a random-sentence generator. Combined with last month's script, it makes a diverting little workshop for constructing and testing simple grammars. But it's also interesting in its own right as an example of following the links among tightly linked fields, so I'm presenting it as this month's project: the Famous GrammarTester Hypertext Trick.

The linked fields from last month's project demonstrate this hypertext technique as well as anything I could imagine, so I'll present it as I wrote it to handle those fields, and leave the task of generalizing the technique to other purposes as an exercise for the reader. That's not quite as lazy as it sounds; most of these hypertext tricks change so much in the process of adapting them to new applications that it makes little sense to try to generalize them. Mine, in fact, grew out of someone else's.

Last month's script generated random, arguably grammatical but rarely profound sentences by picking lines at random from a field of sentence templates. Each line consisted of a description of a sentence type, such as

```
*subject *verbTransitive
*object
```

with grammatical forms distinguished from actual words by a prefixed asterisk. Each time the script came upon an asterisked word, it would immediately pick a line at random from a field of that name. (Excuse me. "Immediately" on my Mac II. Actual performance may vary depending on hardware.) Thus the grammatical forms were also the names of fields, and each field held examples of its named grammatical form: The `*subject` field held things that could function as the subject of a sentence, the `*verbTransitive` field contained transitive verbs, and so on.

When the script came upon a word that had no asterisk, it simply tacked it onto the sentence it was building. But whenever — in any field — it came upon an asterisked word, it treated it as a reference to another field and selected a line at random from that field, interpreting that line a word at a time, just as it had interpreted the previous line. And on and on. So, while the `*subject` field might contain, on one line, a single noun, it might contain on another line a more complex expression, such as

```
*article    *noun    named
*name
```

which describes subjects like

```
the man named Horse
```

and

```
a fish named Wanda.
```

The thing to notice about this process is that these asterisked words could send the random sentence generator script searching through sometimes rather long chains of references to find the next word of the sentence. Interpreting a line from the field of sentence templates would send it to

several other fields, including the `*subject` field; interpreting a line from the `*subject` field could send it to three other fields, as in the example; and each of those fields might generate further field references. Just the complex, interlocking structures of linkages that call for a hypertext trick.

And as I ran the script, I did indeed find myself needing a debugging tool — not to debug the script, which was short and simple, but to debug the pattern of linkage among the fields. I needed to be able to trace those links easily. For example, when I added to the `*predicateNominative` field the deceptively simple line

`*subject`

(because I figured that anything that could serve as the subject of a sentence could also serve as a predicate nominative), I needed to trace through some of the implications of that link.

The script that I came up with to let me trace links among fields is much easier to describe than are the fields on which it operates. It lets you click on a reference to one field in another field, and it jumps to the referred-to field. That's what it does, and how it does it is not much more difficult to describe.

The script is a single `mouseWithin` handler that goes into action whenever the mouse passes within the rectangle of a field. When that happens, the script sets the `textLock` property of the field to false so that the mouse can be clicked in the field to select some text. If that selected text can be interpreted as the name of another field, the script "closes" the current field and "opens" the field referred to.

I have implemented the script as a card script; it needs to be at least at the card level in the hierarchy to apply to all fields.

The terms "open" and "close" are not officially defined for fields, but what I mean by them is just what the terms mean when applied to windows. When a field is closed, it disappears from view and its contents are not visible. When a field is opened, it becomes visible and its contents become accessible. To open or close a field, I use the `show` or `hide` command, and relocate it via the `set` command for good measure. This script closes one field and opens another in exactly the same place while the screen is locked, which produces a smooth replacement effect.

Another concept in need of definition is that "selected text can be interpreted as the name of another field." For my script, that means looking up the text in a field containing the names of other fields. This technique lets me be highly selective about which fields are linkable, but it requires the hassle of maintaining this index field, and I wouldn't have done it this way if I

■ **CARD TRICKS**

didn't need the index field for other purposes anyway. I don't use the fact that my field names begin with an asterisk, but I do have to make sure the asterisk is there to complete the field name. These are points where you will want to customize the script if you use it for another purpose.

... which I encourage you to do. The state of the art of HyperTalk programming is advanced by the borrow-and-enhance strategy (you'll notice that this script grew out of borrowing from Steve Drazga). This hypertext trick could be applied to a wide range of situations in which fields (or cards) need to be linked, but it should be adapted to its purpose. For example, you might find an overlapping placement of "open" fields more appropriate to your purposes than my one-field-at-a-time approach.

There is an important distinction to be made here. The premise of the column is not, "If the script fills a need for you, it's yours." The premise is, "If the script fills a need for you, make it your own." Go ye hence and enhance.

```
--  The Famous GrammarTester HyperText Trick
--
--  Released to the public domain
--  by Mike Swaine, September, 1988.
--
--  This is a card or stack script.
--  It was written specifically for the fields
--  of grammar and vocabulary data used in the
--  Random Sentence Generator published in MacUser
--  December 1988, but it can also be modified
--  for other purposes.
--  It watches over fields, and when the mouse
--  enters the rectangle of one, permits the mouse
--  to select some text, then tries to interpret
--  the selected text (if any) as a reference to
--  another field. As soon as it gets a field
--  reference, it closes the current field like
--  closing a window and opens the referenced field.
--  One might call it a HyperText trick.


On  mousewithin
    --  This script owes something to a HyperText
    --  technique by Steve Drazga of ART Incorporated.
    --  If you use it, please include credit to Steve.
    Global openField
    --  I use the global variable openField to hold
    --  the name of the currently "open" field.
    --  I only let one field be open at a time.
    --  ("Open" here means displayed, not hidden.)
    If the name of the target contains "field"
    --  (that is, if the mouse is within a field)


    Then
        Lock screen -- for speed and neatness.
        --  Unlock the field to allow selection of text.
        Set locktext of target to false
        --  Get the selected text, if there is any.
        Put selection into selectedWord
        --  Try to turn it into a field reference
        --  by adding "*".
```

CARD TRICKS

```
        If selectedWord is not empty then put "*" ¬
        before selectedWord
        -- Is it now a legal field reference?
        -- Check by looking in field "Parts", which
        -- lists all other fields. It's named "Parts"
        -- because the field names are parts of speech
        -- for the Random Sentence Generator.
        If selectedWord is in field "Parts" ¬
        and length(selectedWord)>1

      Then
            -- Hide previously displayed field, if any.
          If openField is not empty

        Then
                Set the topLeft of field openField to 0,0
                -- (or -100,-100 or some safe hiding place)
            Hide field openField

        End if
            -- Show the selected field.

          Put the short name of field selectedWord ¬
          into field "Header"
          Put the short name of field selectedWord ¬
          into openField
          Show field openField at 348,150
          -- (or wherever you want to see it)

      End if
      Unlock screen

    End if
End mousewithin
```

```
Fields required by the script:

field "Parts"
   lists all other fields, one per line.

field "Header"
   above or below the "open" field,
   displays name of "open" field.

other fields
   contain any words, plus field names.
   Each of these field names begins with "*",
   including all field names IN each of these
   fields. Each field mentioned in any field
   must exist and must be listed in the field
   "Parts". Only one of these fields is "open"
   (displayed) at a time. These other fields
   should all be the same size.

All fields are scrolling fields.
```

■ CARD TRICKS

```
Sample field contents
    (not including fields Parts and Header):

field *SentenceForm:
    *subjectS *verbTransS *object
    *subjectP *verbTransP *object
    *subjectS *verbCopS *predNomS
    *subjectP *verbCopP *predNomP
    *subjectS *verbIntransS
    *subjectP *verbIntransP
    *sentenceForm and *sentenceForm
    *sentenceForm because *sentenceForm

field *SubjectS:
    he
    she
    it
    Arthur
    Alice
    *subjectS or *subjectS
    *subjectP or *subjectS

field *SubjectP:
    they
    dogs
    cats

    *subjectS and *subjectS
field *Object:
    me
    you
    us
    him
    her
    it
    them
    *object and *object

field *VerbTransS:
    likes
    hates
    understands

field *VerbTransP:
    like
    hate
    understand

field *VerbCopS:
    is
    was

field *VerbCopP:
    are
    were

field *VerbIntransS:
    barks
    remains

field *VerbIntransP:
    bark
    remain
```

Spend 2 days away get some

Come to the MacUser Marketing Conference. March 2 and 3.

Last year's MacUser Marketing Conference was such a success, we were urged to do it again. Only this year, we're making it even bigger and better. It's going to be two days of intense market analysis—designed to help you understand the Mac market. You'll be able to hear and question some of the best-known experts in the Macintosh field. You'll

meet and talk to the very people who buy Mac products. You'll find out what motivates them and where they make their purchases. You'll see how the market is changing, and how the proliferation of new software applications affects businesses today.

You'll sit in on a number of panels covering new technology; packaging, pricing, distribution, training, as well as products and expectations of the 1990s. Participating

from your office and work done.

speakers will give you a good idea of what Apple is doing now and what they're planning for the next decade.

This conference will give Mac marketers the information needed to develop an effective marketing strategy, and provide a better understanding of the role advertising and PR plays in selling Mac products both at the wholesale and retail levels.

Macintosh marketers who want to cap-

italize on the market will benefit immensely from the conference. There's just one problem. Attendance is limited, so the first order of business is to register this very minute.

The price is only $495. To register or to get more information, telephone MacUser Magazine at (415) 378-5634.

MacUser
Marketing Conference

Like a good wine, software changes over time. Admittedly, it's hard to keep up with all the new versions coming out, but it is important — it allows you to get the most out of your software. For those in the dark, here's a list of the most recent versions (as of press time) of many popular programs.

To see if you have the most current versions, check the About ... item at the top of the Apple menu whenever you run a program.

In the realm of Apple System software, owners of 128K Macs should have System 2.0 and Finder 5.1.

For those with the 512K, 512KE, or XL, you should be running System 3.2 and Finder 5.3. Everyone else should be running System 6.0.2, which should be out by the time this hits the stands.

Some of the more significant updates as of press time are AppleShare 2.0 and QuarkXPress 2.0. Winging its way over AppleTalk networks is Falcon 2.0. QuickMail made some quick fixes with version 1.0.4.

All programs listed here are HFS compatible. From this chart, you can extract the following information: CP or NCP, copy protected or not; //, programs we've found to be Mac II compatible (not yet a comprehensive list); and S, for shareware (try before you buy).

Changes and new listings are in **bold.** Programs that appear to be compatible with the Macintosh II may not actually perform 100 percent of the functions they do on other Macintoshes, nor do they necessarily take full advantage of the Macintosh II.

Program	Version	Type
A.A.I.S. Prolog	M1.15	NCP
Accountant, Inc.	2.1	NCP,//
Acta	2.0	NCP,//
AffiniFile	1.1	NCP,//
AMS General Ledger	2.08	NCP
AppleShare Workstation	2.0.1	NCP,//
Aztec C	3.4b	NCP,//
Backgrounder	1.2	NCP
Back to Basics	1.03	NCP
Balance of Power	1.03	CP
Bulk Mailer	3.0	NCP,//
Business Filevision	1.1	NCP
CalendarMaker	3.0	NCP,//
Canvas	2	NCP,//
Capture	1.1	NCP,//
CAT	2	NCP,//
Chart	1.02	NCP
Chooser	3.3	NCP
ClickArt Effects	1.01	NCP,//
Clipper	1.01	NCP
CloseView	1.0	NCP
Cognate	1.5	NCP,//
ColorChart	1.3	NCP
Colorizer	1.1	NCP,//
ColorMate	2.1	NCP
ColorPrint	2.03	NCP
Comic Strip Factory	1.6	NCP,//
Comic Works	1.0	NCP,//
Comment	2.0	NCP,//
ConcertWare+	4.0	NCP,//
ConcertWare+MIDI	4.0	NCP,//
Control Panel	3.3	NCP
Copy II Mac	7.1	NCP
Copy II HD	7.1	NCP
Cricket Draw	1.1	NCP,//
Cricket Graph	1.2	NCP
Curator	1.04	NCP,//
DA Handler	6.0	NCP
Deluxe Music Construction Set	2.0	CP
Design/IDEF	1.1	NCP,//
DesignScope	1.14	NCP,//
DeskLink	2.0	NCP,//
Disk Express	1.10	NCP
Disk First Aid	1.4	NCP,//
DiskFit	1.4	NCP,//
DiskInfo	1.45	NCP,S
Disk Ranger	3.1	NCP
Disk Tools Plus	1.01	NCP,//
DiskTop	3.0.2	NCP,//
Dollars & $ense	4.0	NCP,//
Double Helix II	r40	NCP,//
"Draw it Again, Sam"	2.04	NCP,//
Easy Access	1.0	NCP
Easy3D	1.01	NCP
Edit	2.1	NCP
Excel	1.5	NCP,//
ExperCommon Lisp	2.2	NCP
ExperLisp	1.5	NCP,//
ExperLogo	1.1	NCP
Expressionist	2.0.3	NCP,//
EZ Draft	2.0	NCP,//
Falcon	2	NCP,//
FastBack	1.02	NCP,//
File	2.0	NCP,//
FileMaker II	1	NCP,//
Finder (HFS)	6.1	NCP
Finder (MFS-128K)	4.1	NCP
Findswell	2.0	NCP,//
1st Aid Kit-HFS	2.5	NCP,//
FlashBack	1.6	NCP
Flight Simulator	1.0	CP

Program	Version	Type
Fokker Triplane	1.0	CP
FONTastic Plus	2	NCP,//
Font/DA Mover	3.8	NCP
Fontographer	2.3	CP
FontShare	1.1	NCP,//
Forecast	2.0	NCP,//
4th Dimension	1.0.6	NCP,//
FoxBASE+/Mac	1.10	NCP,//
Frame Mac	1.1	NCP,//
FreeHand	2.0	NCP,//
FreeTerm	2.0	NCP,//
FullPaint	1.0	NCP
FullWrite Professional	1.0	NCP,//
Gato	1.42	CP
General	3.3	NCP
GeoQuery	1.01	NCP,//
Glue	1.04	NCP
GraphicWorks	1.13	NCP
Handwriting Analyst	1.2	NCP,//
Hard Disk 20	1.1	NCP
Hard Disk Utility	2.0	NCP
HD Backup	1.1	NCP
HD SC Setup Apple	2.0	NCP
HFS Backup	1.1	NCP
HFS Locator Plus	2.0	NCP
HyperCard	1.2.1	NCP,//
HyperDA	1.1	NCP,//
Icon-It!	1.1	NCP,//
Illustrator	1.0	CP/NCP,//
ImageWriter LQ	2	NCP,//
ImageWriter	2.7	NCP
ImageWriter, AppleTalk	2.7	NCP
ImageWriter LQ, AppleTalk	2	NCP,//
InBox	3.0	NCP,//
Insight Expert Accounting	2.01	NCP,//
Installer	2.6	NCP
inTalk	3.0	NCP,//
Jam Session	1.1	CP,//
Jazz	1A	CP
JustText	1.1	NCP
Keyboard	3.3	NCP
Key Layout	2.3	NCP,//
Laser Author	1.3	NCP,//
LaserPaint	1.9	NCP,//
Laser Prep	5.2	NCP
LaserShare	1.0	NCP
LaserSpeed	1.6	NCP,//
LaserStatus	2.0	NCP
LaserWriter	5.2	NCP
LaserWriter IISC	1.1	NCP
Layout	1.3	NCP,S
Legal Billing	1.72	NCP,//
Legal Billing II	2.39	NCP,//
LightSpeedC	3.0	NCP,//
LightSpeed Pascal	2.0	NCP,//
Listen 2.0	2.1	CP,//
Lode Runner	1.0	CP
Lookup	1.0c	NCP,//
Mac3D	2.1	NCP,//
MacASM	1.2	NCP
MacBillboard	4.01	NCP,S
Mac C	5.0	NCP,//
MacCalc	1.2	NCP
Mac Daisy Link	1.04	NCP
Mac Disk Catalog II	2.1C	NCP
MacDraw II	1.0	NCP,//
MacDraft	1.2b	NCP,//
MacFlow	2.04	NCP,//
MacFortran (all)	2.3	NCP,//
MacGolf Classic	3.0	CP,//
MacInTalk	1.1	NCP

Program	Version	Type
MacLabeler	2.2	CP
MacMoney	3.01	NCP,//
MacMovies	1.02	NCP
MacNosy V2	2.8	NCP
MacPaint	2.0	NCP,//
MacPalette	1.0	CP
MacPascal	2.1	CP
MacProject II	1.0	NCP,//
MacProof	3.0	NCP
MacSafe	1.08	NCP,//
MacSchedule	1.1	CP,//
MacScheme+ Toolsmith	1.51	NCP,//
MacServe	2.3	CP,//
MacSpec	1.3	CP
MacSpin	1.1	CP
MacSpool	3.0	NCP,//
MacTerminal	2.3	NCP,//
MacTools (MFS/HFS)	7.1	NCP
MacWrite	5.0	NCP,//
Mac Zap	5.0	NCP,//
MailManager	1.0	CP
Map	1.1	NCP
MapMaker	3.0	NCP,//
Mavis Beacon Teaches Typing!	1.2	NCP,//
MDA	2.0	NCP,//
MDS	2.0	NCP
Measure Test	12.7	CP,S,//
MenuFonts 2	2.0	NCP,//
Megamax C	3.0	NCP
MGMStation CAD	2.5	NCP,//
MicroPhone II	2	NCP,//
Micro Planner Plus	6.0	NCP,//
MindWrite	2.0	NCP,//
miniWriter	1.4	NCP,S
MockPackage+	4.3.4	NCP,S
Modern Artist	2.0	NCP,//
MORE	II	NCP,//
Mouse	3.3	NCP
MPW	2.0b	NCP
MS BASIC	3.0	NCP
MS BASIC Compiler	1.0	NCP
MS Fortran	2.2	NCP
MS Works	1.1	NCP,//
MultiFinder	6.0	NCP,//
Multiplan	1.11	NCP,//
MusicWorks	1.1	CP
myDiskLabeler	2.11	NCP,//
'Ncryptor	2.0	NCP,//
Neon	2.0	NCP
NightWatch	1.02	NCP,//
Omnis III Plus	3.25	NCP,//
On Cue	1.3	NCP,//
Orbiter	1.2	NCP,//
OverVUE	2.1e	NCP,//
PageMaker	3.0	NCP,//
Parameter Manager Plus	2.2	NCP,//
Performer	2.31	CP
PictureBase	1.2	NCP
Plains and Simple	4.1	NCP,//
PLP	2.0	NCP
PowerPoint	2.0	NCP,//
PowerStation	2.5	NCP,//
Print Monitor	1.2	NCP,//
Professional Composer	2.1	CP
Profit Stalker II	1.3	NCP
Programmer's Online Companion	2.0	NCP,//
Project Billing	3.0	NCP,//
Pyro!	3	NCP,//
QuarkXPress	2.0	NCP,//

Program	Version	Type
QUED/M	2.07	NCP,//
QuicKeys	1.1	NCP,//
QuickMail	1.0.4	NCP,//
QuickWord	2.0	NCP,//
Rags to Riches	3.0	CP,//
Ragtime	2.01	NCP,//
Read-It!	2.0	NCP,//
Ready, Set, Go!	4.0a	NCP,//
Record Holder	2.1	NCP
REdit	1.2	NCP
Red Ryder	10.3	NCP
Reflex Plus	1.01	NCP,//
Reports	1.2	NCP,//
ResEdit	1.1b7	NCP,//
Sargon III	1.0	CP
Scoop	1.01	NCP,//
Scrapbook	2.4	NCP,//
Sensible Grammar	1.1d	NCP,//
SideKick	2.0	NCP
Silicon Press	1.1	NCP
Slide Show Magician	1.3	CP
Smartcom II	3.0A	NCP,//
SmartScrap & The Clipper	1.03	NCP,//
Sound	3.3	NCP,//
SoundCap	4.4	CP
Space Edit	2.0	CP,//
SpellNow	1.0	NCP
Spellswell	2.0f	NCP,//
Startup Device	3.3	NCP,//
StatView 512+	1.1	NCP
StatWorks	1.2	NCP,//
Stella	1.3	CP,//
Stepping Out II	2.01	NCP,//
Straight Talk	2.08	NCP,//
Studio Session	1.4	CP
Suitcase	1.2.1	NCP,//
SuperGlue	1.03	NCP,//
SuperPaint	1.00	NCP,//
Switcher	5.1	NCP
Systat	3.2	NCP
System (HFS)	6.0.2	NCP,//
System (MFS-128K)	2.0	NCP
Telescape	1.0	NCP,//
Telescape Pro VT 100	1.1	NCP
Tempo II	1.1	NCP,//
Tetris	1.1	NCP,//
Textures	1/01	NCP,//
Think 'n Time	2.0	NCP,//
ThinkTank	2.0	NCP,//
Thunder!	1.0.1	NCP
Thunderscan	4.0	NCP
TML Pascal	2.01	NCP
TMON	2.8	NCP
Top Desk	3.0	CP
TOPS	2.0	NCP,//
Trapeze	2.1	NCP,//
Turbo Download	2.1	NCP,//
Turbo Maccountant	2.0	NCP,//
Turbo Pascal	1.1	NCP,//
Type Now	1.0	NCP,//
VersaCAD	2	NCP,//
VersaTerm	3.0	NCP
VersaTerm Pro	2.0	NCP
VideoWorks II	2.0	NCP,//
VIP	2.5	NCP,//
Widgets	3.0	NCP
Word	4.0	NCP,//
WordPerfect	1.0.1	NCP,//
Write	1.0	NCP,//
WriteNow	1.07	NCP,//
ZBasic	4.0	NCP

MINIFINDERS

Have you often wished for a personal assistant to help in picking software? These MiniFinders may not breathe and move, but they do tell you what products are hot and, better, what these products do. Each of these items has been carefully reviewed and selected by the *MacUser* editorial staff. Each has been rated in increments of half mice, from 1 to 5. Ratings are relative within categories, and they can change as categories expand and new products advance the state of the art. You won't see many low ratings or bombs, since we're telling you about the cream of the crop, but we will warn you about the really bad products so that you don't spend your money on them. **Red names indicate this month's additions.** The letters at the end of the entries indicate whether a product is copy protected (CP) or not (NCP). If a product has been reviewed or Quick Clicked in *MacUser*, the date of the review is shown. Eddy (Editor's Choice) Award winners are noted with a ★ and the year in which they won prizes for an excellent product. Next time you have to find products you can count on, count on *MacUser*!

MINIFINDER INDEX

BUSINESS ACCOUNTING

Accountant, Inc. integrates accounts payable, accounts receivable, general ledger, and inventory modules. Prints checks, purchase orders, invoices, customized reports. Bare-bones accounting system limited in size and scope, but ease of use and integration make it suitable for small businesses. Requires 512K+. Version 2.0. $299. SoftSync, 162 Madison Ave., New York, NY 10016. NCP (Oct '87)

Back to Basics Accounting is a powerful double-entry accounting software package for the small business user with GL, AR, and AP modules. Exhaustive manual with numerous examples. Report capabilities are excellent. $199. Peachtree, 4355 Shackleford Road, Norcross, GA 30093. NCP (May '87)

BPI General Accounting is an easy-to-use system. Six journals, AR, AP, Payroll, and GL on one disk. Offset amounts automatically post to ledgers. Up to 8000 accounts. Detailed records, wide range of reports. Requires 512K+. $249. BPI Systems, 3001 Bee Cave Road, Austin, TX 78746. NCP (Aug '86)

Insight is a high-powered accounting program for the small-to-medium-sized business. Modules include Accounts Receivable, Payables, and General Ledger; others are in the works. Requires 512K and hard disk. $595. Layered, 529 Main St., Boston, MA 02129. NCP (Dec '86) ★'86 Eddy

Rags to Riches integrated accounting modules (General Ledger and Accounts Receivable) uses Mac interface to the hilt. Information entered in one window automatically transfers. Detailed, flexible report options. Very easy to use, but it can be confusing with several windows on-screen. Requires 512K+ and printer. $199.95 per module. Chang Labs, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Dec '85)

Rags to Riches Professional Billing tracks and bills professional services. Batches activities for individual timekeepers. Use as stand-alone, or integrate with R to R modules. Requires 512K+, printer. $399.95. Chang Labs, 5300 Stevens Creek Blvd.; San Jose, CA 95129. NCP (Feb '87)

Simply Accounting has six ledgers and eight journals to handle the needs of most small-to-medium sized businesses. Better Mac interface than most. Payroll tax labels can't be modified, which forces you to subscribe to Bedford's yearly update service. Version 1.03. Requires 1 megabyte. $349. Bedford Software, 15311 N.E. 90th St., Redmond, WA 98052. NCP (Sept '88)

Strictly Business General Ledger features clear, well-outlined setup procedures and operations. Very flexible, up to 99 profit centers with up to 100 departments each, and customized reports. Program print spools. Requires 512K+, printer and external drive. $395. Future Design, 13681 Williamette Drive, Westminster, CA 92683. NCP (Dec '85) ★'85 Eddy

Timeslips III tracks billing and expense information for people who charge by the hour. DA turns the clock on and automatically bills a client when a session is over. Version 1.06. Requires 512K and two disk drives. Mac II and MultiFinder friendly. $199.95. North Edge Software, 239 Western Ave., Essex, MA 01929. NCP (Sept '88)

PERSONAL FINANCE

Dollars & Sense is a bookkeeping program. Easy to use, with a good manual and excellent on-screen help. Will handle up to 120 separate accounts or money categories. Uses standard double-entry accounting techniques. Will work on 128K. $149.95. Monogram, 8295 S. La Cienega Blvd., Inglewood, CA 90301. CP (Mar '87)

MacInTax is an excellent tool for preparing tax forms. Intuitive, easy-to-use. Accepts data from leading personal finance programs. Good built-in help. Liberal upgrade policy for current owners. California forms set also available. $119 federal; $65 California. SoftView, 4820 Adohr Lane, Suite F, Camarillo, CA 93010. NCP (Mar '87) ★'86 Eddy

MacMoney is a financial manager that uses information gleaned from your checks and deposit slips. Produces a variety of reports and graphs. Version 3.1 reviewed. Requires 512KE and printer. $119.95. Survivor Software, 11222 La Cienega Blvd., Inglewood, CA 90304. NCP (July '88) ★'86 Eddy

Quicken helps you write checks, then keeps a ledger showing you where all of your money goes. Tax information is automatically generated. Version 1.0. Requires 512K and printer. $49.95. Intuit, 540 University Ave., Palo Alto, CA 94301. NCP (Nov '88)

Wall Street Investor spots stock market trends. Downloads information from an electronic service. Good charting ability. Previously known as Market Pro. Version 2.1. Requires 1 megabyte, two 800K drives or hard disk, Hayes-compatible modem, and an I.P. Sharp account. $495. Pro Plus Software, 2150 East Brown Road, Mesa, AZ 85203. NCP (Oct '88)

DATABASES

Business Filevision is a graphic database. Much more powerful than the original, accepts MacPaint graphics. $395. Marvelin, 3420 Ocean Park Blvd., Santa Monica, CA 90405. NCP (Feb '86)

C.A.T. is a dedicated relational database for managing contacts, activities and time. Links between types of data make it easy to keep track of important people and events. $399.95. Chang Laboratories, 5300 Stevens Creek Blvd., San Jose, CA 95129. NCP (Nov '87)

dBASE Mac is a relational DBMS that includes a structured programming language to develop stand-alone applications. Palette icons as alternatives to menu commands will help novice users. Requires 1 megabyte +. $495. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319. NCP (Feb '88)

Double Helix II is a powerful database that supports a multiuser environment with an upgrade. Uses an icon-based development system for easy creation of databases. $595, single-user version. Odesta, 4084 Commercial Blvd., Northbrook, Ill 60062. NCP (Apr '88)

FileMaker II is a multiuser version of the all-time best flat file manager for the Macintosh. New features include more flexible layouts, hierarchical menus, and color on the Mac II. Version 1.0. Requires 1 megabyte with two 800K drives or a hard-disk drive. $299. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Dec '88)

4th Dimension is a versatile tool that creates stand-alone relational databases. Design and layout environments allow easy linking of information. Robust. Pascal-like procedure language. $695. Acius, 20300 Stevens Creek Blvd., Cupertino, CA 95014. NCP (Nov '87) ★'87 Eddy

MINIFINDERS

FoxBASE+/Mac is a relational database that can read unmodified dBASE III ★★★★½ PLUS applications created in the MS-DOS world. Amazingly fast. Good implementation of dBASE on the Mac. Version 1.0. Requires 1 megabyte. Mac II and MultiFinder friendly. $395. Fox Software, Inc., 118 W. South Boundary, Perrysburg, OH 43551. NCP (Sept '88)

MacDewey! is a cataloging program featuring the Dewey Decimal Classification ★★★ system. Uses predefined fill-in-the-blank fields to create catalog cards. Suffers from bugs in search routines and the inability to distinguish first names. Not for professionals; home libraries might benefit. Version 2.5. $79.95. Mousetrap Software, 336 Coleman Drive, Monroeville, PA 15146. NCP (Nov '87)

Omnis 3 is a power database, featuring concurrent-multiple-file management. ★★★★ Can handle 24 files, 12 at a time, and is fully relational. Create custom environments, including user-defined menus, commands, and dialogs. $495. Blythe, 2929 Campus Drive, San Mateo, CA 94403. NCP (Mar '86)

OverVUE is a power-packed relational database that has extensive sorting, sum- ★★★★½ marizing, and report generation capacity. Has macros, and a charting function. Good manual. It can exchange files with a very wide variety of other programs (including IBM software). $295. ProVUE, 222 22nd St., Huntington Beach, CA 92648. NCP (Nov '85) ★'85 Eddy

Record Holder Plus is a flexible, easy-to-use, form-oriented data manager. Setup ★★★★ is particularly simple and the search features are powerful. $69.95. Software Discoveries, 137 Krawski Drive, South Windsor, CT 06074. NCP (Apr '86) ★'87 Eddy

Reflex for the Mac is a flexible relational database. Excellent report generator ★★★★½ gives full control over appearance, style of output. Requires 512K+, second drive, or hard disk. $99.95. Borland International, 4585 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Dec '86) ★'86 Eddy

Reflex Plus is a relational database with "smart" entry, and report design, but no ★★★★ overall programming facility. Simple to set up, yet fast. Graphic capabilities are quite limited. Version 1.0 reviewed. $279. Borland/Analytica, 4585 Scotts Valley Drive, Scotts Valley, CA 95066-9987. NCP (Feb '88)

Writer's Workshop maintains orderly records for writers. It can track manuscripts, ★★★½ income, and publisher. Based on and includes Runtime Helix. $99.95. Future-soft System Designs, P.O. Box 132, New York, NY 10012. NCP (Apr '87)

NUMBER CRUNCHING

Data Desk Professional lets you visually look at statistics with more ease than ★★★★½ any comparable Macintosh program. Plots variables so you can analyze data to see what patterns develop. Version 2.0. Requires 1 megabyte and two 800K disk drives or hard disk. $495. Odesta, 4084 Commercial Ave., Northbrook, IL 60062. NCP (Nov '88)

Excel is THE power spreadsheet of the Mac. Has 256-column by 16,384-row ★★★★★ capability. Features include a powerful macro function (with a recorder to make creation simple) and elaborate charting facilities. 512K+ Mac and external drive required. $395. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. NCP (Prem) ★'85 Eddy

MacCalc is a fast, competent, full-featured spreadsheet with impressive built-in ★★★★ functions, font control, on-line help, ability to expand columns and rows, and read/write SYLK or WKS files. The worksheet is 125 columns by 999 rows. A very flexible, pure spreadsheet. $139. Bravo Technologies, c/o DPAS, P.O. Box T, Gilroy, CA 95021. NCP (Sept '86) ★'86 Eddy

MacSpin is a unique and powerful graphic data analysis program. Handles multi- ★★★★ variate data in a highly visual manner. Nothing else like it for any micro. $199.95. D² Software, P.O. Box 9546, Austin, TX 78766-9546. CP (June '86) ★'87 Eddy

MacSQZ! compresses Excel files up to 88 percent of their actual size. Good to free ★★★★★ up disk space. Also contains password utility. MultiFinder hostile. Requires Excel. Version 1.01. $79.95. Turner Hall Publishing, 10201 Torre Ave., Cupertino, CA 95014. NCP (Aug '88)

Mathematica is a powerful tool for doing all kinds of math. Offers arbitrary-preci- ★★★★½ sion numeric calculations, symbolic computation, PostScript graphics, and programmability. Version 1.03. Requires 1 megabyte+ and a hard-disk drive. 2 megabytes RAM required to run kernel. $495, $795 for the Mac II version. Wolfram Research, P.O. Box 6059, Champaign, IL 61821. NCP (Nov '88)

MathView Professional is an equation solver that combines two- and three- ★★★★ dimensional plotting with routines for matrices, differential equations and integrals, complex numbers, and the like. Interface leaves a lot to be desired. Version 1.0. Requires 512KE and two disk drives. Mac II and

These two drives are identical.

But there are five differences.

MINIFINDERS

MultiFinder friendly. $249.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP (Sept '88)

Microtemp Financial Calculators is a set of worksheets for Excel and Works that
♦♦♦½ calculates common personal and small business financial problems. Includes cash flow, real estate and rate of return calculators. Version 1.0. $79.95. Microtemp, P.O. Box 1208, Santa Rosa, CA 95402. NCP (Aug '88)

Mindsight is a professional level, decision-support, and business planning package.
♦♦♦♦ age. Can work with IFPS on mainframes, and is able to transmit models in both directions. Powerful and easy to use. Requires 512K+. $249. Execucom Systems, P.O. Box 9758, Austin, TX 78766. CP (Dec '86)

Parameter Manager Plus is a data manager, incorporating integrated scheduling,
♦♦♦♦ statistics, and graphics. It has solid spreadsheet, calendar, and database functions and reports can be customized using other software. Parameter Manager can also import data from Excel or Lotus 1-2-3. $395. Rebus, 2330-B Walsh Ave., Santa Clara, CA 95051. NCP (July '87)

StatView 512+ is a very intuitive statistical analysis program with tools needed
♦♦♦♦♦ to understand any set of data. Holds data in a spreadsheet-like form. Full-featured, fast, and accurate. Extremely wide range of analyses possible. Requires 512K+ and 800K of disk space to operate. $349.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP (Dec '86)

StatView II is a remarkably complete data analysis package. Essential for any kind
♦♦♦♦♦ of descriptive, comparative, or multivariate statistics. Works in color on the Mac II. Version 1.01. Requires Mac II or SE equipped with 68020 and 68881 math coprocessor; two 800K disk drives or hard disk. $495. Abacus Concepts, 1984 Bonita Ave., Berkeley, CA 94704. NCP (Oct '88)

101 Macros for Excel offers all the power of macros without having to learn how
♦♦♦♦ to write them. Some gems include a macro to transpose rows and columns, and a search and replace macro. Requires Excel. $69.95. Macropac International, 19855 Stevens Creek Blvd., Cupertino, CA 95014. NCP (July '88)

GRAPHICS & DESIGN

ArtWare: Borders enables you to customize your own clip art disk. The border
♦♦♦♦ collection is the best package in terms of quality of art. Other packages available. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $129. Artware Systems, 3741 Benson Drive, Raleigh, NC 27609. NCP (Aug '88)

Canvas is a Draw and Paint program that uses QuickDraw as its output language.
♦♦♦♦½ Full of features, including free rotation and one-and-two-point perspective. Also has graphics macro commands, unusual in a program this inexpensive. $295. Deneba, 7855 N.W. 12th St., Suite 202, Miami, FL 33126. NCP (Jan '88)

Chart can easily create area, bar, column, line, pie, scatter, and combination
♦♦♦½ charts. A total of 42 styles are provided. Limited to 100 data items (64 in a series) on a 128K Mac, approximately twice that on a 512K Mac. $125. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. CP

Click & Clip offers seasonal graphics packages. Of the two quarterly editions
♦♦♦ released, the Spring '88 package is the better collection. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $39.95 per edition. Studio Advertising Art, P.O. Box 18432-52, Las Vegas, NV 89114. NCP (Aug '88)

Comic Strip Factory is an assembly program for creating comic strips. Includes a
♦♦♦♦½ database of parts for various characters and backgrounds for panels. Good text editing in balloons. Can import and export in MacPaint format. $69.95. Foundation Publishing, 5100 Eden Ave., Suite 307, Edina, MN 55436. NCP (Dec '87)

Cricket Draw is an object-oriented drawing program that will produce stunning,
♦♦♦½ high-quality output. Designed to print on PostScript-compatible devices, such as the LaserWriter. $295. Cricket Software, 40 Valley Stream Parkway, Malvern, PA 19355. NCP (May '87)

Cricket Graph easily generates 12 graph types. Multiple windows can be dis-
♦♦♦♦♦ played. Graph prints in up to eight colors with up to 16 patterns. Self-generating macro formatting. Switcher, HFS, LaserWriter, and plotter compatible. $195. Cricket Software, 40 Valley Stream Parkway, Malvern, PA 19355. NCP (June '86) ★'86 Eddy

MINIFINDERS

Cricket Presents is a presentation tool with strong emphasis on graphics. Good master template. Lacks import capability for text. Version 1.0. Requires System 4.2 or later. $695. Cricket Software, 40 Valley Stream Parkway, Great Valley Corporate Center, Malvern, PA 19355. NCP (Nov '88)

Crystal Paint creates an electronic kaleidoscope. It is MacPaint's Brush Mirrors gone wild in a small, simple, yet wonderful application. Does not work in color on Mac II. MultiFinder friendly. Requires 512K+. $49.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Feb '88)

Curator catalogs your art and graphics so it's easy to see what's what and where it is. Supports PICT, TIFF, EPSF, PostScript, MacPaint, and more. Changes creator types. Requires 512K and an 800K drive. $139.95. Solutions International, 30 Commerce St., Williston, VT 05495. NCP (Sept '88)

DeskPaint is a full-blown paint program as a desk accessory. Allows you to spruce up a graphic while in another application. Imports and exports MacPaint and TIFF images. Great for DTP, but not enough features to rival the leaders in paint programs. Zedcor, 4500 E. Speedway, Tucson, AZ 85712-5305. NCP (Mar '88)

EPS Illustrations is a potpourri of illustrations with no real focus. As an art package, this one is not very useful as you cannot alter any of the drawings. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $129.95. T/Maker, 1973 Landings Drive, Mountain View, CA 94043. NCP (Aug '88)

EZ Draft is a high-level CAD application. Does things usually only found on mini-computer programs. Uses "pop-up" menus to supplement a full set of pull-down menus. Comes with an additional set of printer/plotter/monitor drivers. A real powerhouse. $1995. $500 for IEGS module to link to other CAD programs. Bridgeport Machines, 500 Lindley St., Bridgeport, CT 06606. CP (May '87)

FastForms! Construction Kit is both a fast and efficient business forms creator (a drawing program) and a specialized application (and DA) to fill out the data fields in your forms. $149 (U.S.). Shana Enterprises, Advanced Technology Center #105, 9650-20 Ave. Edmonton, Alberta T6N 1G1, Canada. NCP (Nov '87)

Fluent Fonts is a two-disk collection of fonts. Forty-nine different items are included. All install easily in user systems. Most are well executed and some are extraordinarily nice. This is a real bargain for font lovers. $49.95. Casady-Ware, P.O. Box 223779, Carmel, CA 93922. NCP

Fontastic is a font editor that features a large editing window with a grid to make positioning easy. Select letters to edit by clicking on a matrix of the font. Allows scaling of existing fonts and previewing the various styles. $49.95. Altsys, P.O. Box 865410, Plano, TX 75086. NCP (Dec '85)

Fontographer is a complex, but excellent laser font creator. The fonts created have 300 bits-per-inch resolution. The fonts are actually downloadable PostScript files. $395. Altsys, P.O. Box 865410, Plano, TX 75086. CP

FreeHand greatly simplifies the drawing of curves, the use of layers and text handling when manipulating PostScript graphics. And it works in color on the Mac II. Requires 1 megabyte and two disk drives. $495. Aldus, 411 First Avenue South, Seattle, WA 98104. NCP (Aug '88)

FullPaint is an expanded version of MacPaint. Features include full-screen drawing, up to four documents open simultaneously, brush editing, and movable tool palettes. $99.95. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502-1319. NCP (June '86) ★'86 Eddy

GraphicWorks 1.1 is a powerful drawing and painting program that creates high-resolution bit-maps. Easels contain graphics, balloons hold text, and both reside on panels. Graphic primitives are now a separate tool. $149.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. NCP (Oct '87)

Illustrator 88 is a professional-level graphics program from the people who defined the PostScript language. Uses templates for precise drawing and detailed artwork. Requires 1 megabyte. $495. Adobe Systems, 1585 Charleston Road, Mountain View, CA 94039. NCP (Oct '88)

Image Club is an overwhelming collection of EPS clip art available on disk and CD-ROM. Comes with a well-designed catalog of images. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $99. Image Club Graphics, 2915 19th St. N.E., Calgary, Alberta, Canada T2E 7A2. NCP (Aug '88)

CDA Makes Macintosh Affordable ... New Low Pricing!!!

AD #3601

Macintosh Plus Entry System

Complete System Includes:
- Macintosh Plus Computer w/1 Megabyte of Memory 1 Internal 800K Drive Keyboard & Mouse
- 6.0 Operating System
- Cutting Edge 800K External Drive
- Apple ImageWriter II w/Cable
- HyperCard Software
- Diskettes — Box of 10
- Computer Paper — Pkg of 500
- Mouse Pad

Sugg. list $2760   **CDA $2075**
Specify package #8910

Macintosh SE Super System

Complete System Includes:
- Macintosh SE Computer w/2 Internal 800K Drives 1 Megabyte of Memory Keyboard and Mouse
- 6.0 Operating System
- ImageWriter II Printer
- ImageWriter Cable
- HyperCard Software
- Diskettes — Box of 10
- Computer Paper — Pkg of 500
- Dust Cover for Macintosh SE
- Dust Cover for ImageWriter II
- Mouse Pad

Sugg. list $3980   **CDA $3099**
Specify package #8970

Macintosh SE/20 Super System

Same as above system except Macintosh includes one 800K Floppy and an Apple 20 Megabyte Internal Drive

Suggested list $4469
CDA $3599

When ordering specify package #8971

Macintosh II 40 Meg Super System

System Includes:
- Macintosh II CPU w/ 800K Floppy Drive 1 Megabyte of RAM System 6.0 Operating System HyperCard Software
- Apple Extended Keyboard
- Apple 40 Megabyte Internal Hard Drive
- Apple Video Display Card
- Apple High-Res RGB Color Monitor
- Apple ImageWriter II Printer
- ImageWriter II Printer Cable
- Package of Computer Paper
- Mouse Pad
- Dust Cover for Computer & Keyboard
- Dust Cover for ImageWriter II
- Diskettes — Box of 10

Sugg. List $9809   **CDA $6495**
Specify package #8960

Above system with Apple 80 Megabyte
Hard Drive   **CDA $7195**
When ordering specify package #8961

Above System with Rodime 140 Megabyte
Hard Drive   **CDA $6995**
When ordering specify package #8906

Macintosh SE/45 Performance System

Same system except Macintosh SE features two internal 800K disk drives and an internal 45 megabyte Seagate Hard Drive

Suggested list $5055
CDA $3799

When ordering specify package #8980

Apple Hardware

Macintosh Plus	$1399
Macintosh SE-Keyboard	$2595
Macintosh SE/20-Keybd	$3149
Macintosh II w/Extended Keyboard	$3999
Mac II/40 w/Extended Keyboard	$4999

Monitors

Apple
Mac II Monochr. Monitor	$ 329
Mac II RGB Monitor	$ 799
Sony CPD1303 RGB	$ 675
E-Machines T16	$2779
E-Machines C20	$4295
Magnavox RGB w/ T&S	$ 599

Raster Ops
19" Color with Tilt/Swivel	$2399
16" Color Trinitron	$2249
19" Color Trinitron	$3149
Tilt/Swivel for Trinitron	$ 249
Color 108 Board—8 bit	$1196
Color 104 Board—8 bit	$3520

Sigma Designs
LaserView SE	$1799
LaserView II	$1799
PageView SE	$1575
SilverView	$1949

Modems

Epic Mac II. 2400	$299
Practical Peripherals	
1200SA Modem	$112
2400SA Modem	$184
Shiva Netmodem V2400	$432
Apple Fax Modem	$585
Abaton Interfax	$279

Accessories

Super-Base	$ 34
Mac II Monitor Extension	$ 35
Targus Plus/SE Carry Case	$ 69
Targus SE w/Ext Key Case	$ 69
Targus Image II Case	$ 49
Imagewriter II Blk. Ribbon	$ 4
Tilt & Swivel Stand	$ 23
Apple MIDI Interface	$ 82
Bose RoomMate II Speakers	$229
Passport MIDI Interface	$ 99
Passport MIDI Transporter	$319

Drives

Apple 3.5 Disk Drive	$339
Central Point 3.5	$186
Cutting Edge 800K	$175
CMS Enhancements	
Compact SC30 (38ms)	$586
Compact SC45 (29ms)	$789
MacStack 20 SD20 (65ms)	$503
MacStack 30 SD30 (38ms)	$567
MacStack 60 SD60 (40ms)	$779
Tape Stack 60	$732
Internal SE PRO-30 (38ms)	$479
Internal SE PRO-45 (29ms)	$672
Everex	
EMAC 20 Deluxe (38ms)	$ 549
EMAC 40 Deluxe (28ms)	$ 799
EMAC 60 Deluxe (29ms)	$ 999
EMAC 80 Deluxe	
EMAC 20D (65ms)	$ 499
EMAC 40 Impact (28ms)	$ 769
EMAC 40+ Impact	$ 799
EMAC 60 Impact	$ 969
EMAC 80 Impact	$1249
EMAC 60 TL 60 Meg Tape	$ 786
Everex Internal Hard Drives	
EMAC 20iD for Mac II	$ 449
EMAC 40iD for Mac II	$ 689
EMAC 60iD for Mac II	$ 865
EMAC 80iD for Mac II	$1149
Rodime Drives	
Plus External Series 20 thru 140 Megabytes	Please Call
RX Internal Series 20 thru 140 Megabytes	Please Call

Input Devices

Abaton ProPoint	$107
Asher Track	$ 77
Apple Extended Keyboard	$199
Data Desk 101 Keyboard ADB w/Masterkeys Software	$159
Data Desk 101 Keyboard-Plus w/Masterkeys Software	$159
Kensington Turbo Mouse	$109

Scanners

Apple Flatbed Scanner	**$1599**
AST Research	
TurboScan — Sheetfed	$1259
TurboScan — Flatbed	$1409
Thunderware	
Thunderscan 4.0	$ 197
Mac II Power Accessory	$ 40

IBM in Your Macintosh

Apple 5.25 Drive	$ 329
AST Mac 86 (Mac SE)	$ 479
AST Mac 286 (Mac II)	$1089
DaynaFile 360K 5.25	$ 499
DaynaFile 1.2 - 5.25 Drive	$ 590
DaynaFile Other Formats	CALL

Memory/Speed Upgrades

1 Megabyte Upgrade (Mac II)	$419
2 Megabyte Upgrade (Mac SE or Plus)	$745
4 Megabyte Upgrade (Mac SE, Plus or Mac II)	$1450
CDA Tool Kit for Opening Mac 512/Plus/SE	$ 24

Printers

(prices include required cable)
Apple ImageWriter II	$ 499
Image II Sheetfeeder	$ 189
Apple ImageWriter LQ	$1099
Apple LaserWriter IISC	$2249
Apple LaserWriter IINT	$3895
Apple LaserWriter IINTX	$5495
GCC Personal Laser	
Printer	$1572
GCC PS Laser Printer	$3342
QMSPS810	$5359
Orange Micro	
Grappler C/MAC/GS (9 pin)	$75
Grappler LQ (24 pin)	$99
Grappler LS Serial Laser	$89

MINIFINDERS

ImageStudio puts a photo-retouching lab on the desktop. Editable brushes let
⚡⚡⚡⚡⚡ you modify digitized images in 65 gray levels. Version 1.0 reviewed. Requires 1 megabyte + and two 800K disk drives. Mac II and MultiFinder friendly. $495. Letraset USA, 40 Eisenhower Drive, Paramus, NJ 07653. NCP (June '88)

Images with Impact! brings clip art out of the turn-of-the-century woodcut style
⚡⚡⚡⚡⚡ and into a modern graphic sensibility. "Graphics and Symbols 1" is the first in a series. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $99.95. 3G Graphics, 11410 N.E. 124th St., Kirkland, WA 98034. NCP (Aug '88)

Japanese Clip Art is a two-disk set of extraordinary Japanese clip art. Consists of
⚡⚡⚡⚡½ MacPaint documents and separate fonts. Volume I, Heaven, covers mythological subjects; Volume II, Earth, has secular subject matter. $79.95 each volume; $149.95 each set. Qualitas Trading, 6907 Norfolk Road, Berkeley, CA 94705. NCP (Apr '87)

LaserFonts are new fonts for the LaserWriter. Users download them to their
⚡⚡⚡⚡ machines. Very high quality and very simple to use. Willamette looks like Avant Garde. MicroFonts provides tiny, expanded, and condensed versions of the LaserWriter's own fonts. $34.95 to $44.95 each. Century Software, 2483 Hearst, #175, Berkeley, CA 94709. NCP

LaserPaint's clumsy interface makes it a slow program. There's good laser output
⚡ if you persevere through the creation of a document. The support is scads better than the documentation. Version 1.1.4. $495. LaserWare, P.O. Box 668, San Rafael, CA 94915. CP (Jan '88)

Lasertalk is a PostScript programming tool that establishes interactive contact
⚡⚡⚡⚡⚡ with laser printers. Preview window and on-line help make it a powerful tool. Requires 1 megabyte + and a PostScript Printer. $249. Emerald City Software, P.O. Box 2103, Menlo Park, CA 94026. CP until registered (May '88)

Mac Art Dept. is a collection of over 150 graphic images ranging from foods to
⚡⚡⚡⚡ hands holding signs to borders. Best suited for letterheads, memos, other business use. $39.95. Simon & Schuster, Computer Software Div., 1 Gulf + Western Plaza, New York, NY 10023. NCP (Mar '86)

MacCalligraphy simulates brush painting. User-designed Seals and Touches
⚡⚡⚡½ enable you to design your own signature tool and the style of brush you use. Takes some getting used to. $175. Qualitas Trading, 6907 Norfolk Road, Berkeley, CA 94705. NCP (Feb '88)

MacDraft is an object-oriented graphics program. It sports advanced features
⚡⚡⚡⚡ such as variable scaling, single-degree rotation, complex arcs, auto dimensioning, and variable zoom/reduction. $269. Innovative Data Design, 2280 Bates Ave., Concord, CA 94520. NCP (Feb '86)

MacDraw is an object-oriented graphics program. Can be used to design forms,
⚡⚡⚡⚡ create presentation materials, and do technical illustrations. Drawing sizes up to 8 feet by 10 feet are possible. Lacks free notation or zoom-in capabilities. $195. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Nov '85) ★'85 Eddy

MacDraw II updates the venerable object-oriented draw program. Adds dithered
⚡⚡⚡½ and color patterns in its own documents, but doesn't support color in the PICT II format. Version 1.0. Requires 1 megabyte, and two 800K disk drives or hard disk. $395. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Nov '88)

MacPaint hasn't lost its shine after all these years. Version 2.0 supports multiple
⚡⚡⚡½ windows, design templates, and a magic eraser to correct corrections. It lacks free rotation or distortion talents. Requires 512K and second disk drive. $125. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (July '88) ★'85,'87 Eddy

Mac3D is a feature-laden 3-D program with a MacDraw-like interface. PostScript-
⚡⚡⚡½ resolution shading with six variable light sources, user-definable tools, and many more features. Clumsy interface to rotate objects and camera. Version 2.0. $249. Challenger Software, 18350 Kedzie Ave., Homewood, IL 60430. NCP (Jan '87)

MapMaker is a digital cartographer that charts demographic and marketing infor-
⚡⚡⚡⚡½ mation on a geographic basis. Wide variety of maps available, some at an additional cost. Version 3.0. Requires 512K. $349. Select Micro Systems, 40 Triangle Center, Yorktown Heights, NY 10598. NCP (Dec '88)

MGMS: Professional CAD for Macintosh offers more than 200 functions. Very
⚡⚡⚡⚡ complete, capable program. Groups, Dimension, Libraries, etc., are standard. Sometimes confusing — designed for experienced, profes-

sional CAD user, not the novice. Full plotter support. 512K+. $799. Micro CAD/CAM, 3230 Overland Ave., Los Angeles, CA 90034. NCP (Nov '87) ★'87 Eddy

MiniCad is a pro-level CAD package. Vast array of features, many accessible only ♦♦♦♦ through Command/Shift/Option key combinations. Works in 2-D or 3-D with easy transition from one to the other. MacDraw-like interface makes it easy to learn and use. Version 3.0. Requires 512K+. Diehl Graphsoft, 8370 Court Ave., Suite 202, Ellicott City, MD 21043. CP (Oct '87)

PictureBase is a powerful graphic librarian. You can store paint and PICT format- ♦♦♦♦½ ted items and attach keywords for later search and retrieval. $69.95. Symmetry, 761 E. University Drive, Mesa, AZ 85203. NCP (Sept '87) ★'86 Eddy

Pixel Paint is a color paint program with customizable palettes and a lot of special ♦♦♦♦½ effects. Slow Open and Save. Requires Mac II, 2 megabytes, and 8-bit video card. $495. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (May '88)

Post Art I is a collection of signed originals on disk. Overall, a pretty useless ♦ collection in terms of clip art. Meant for hanging prints on a wall. Requires a program that reads Encapsulated PostScript Format (EPSF) files. $69.95. Olduvai, 7520 Red Road, S. Miami, FL 33143. NCP (Aug '88)

PowerPoint is an easy-to-use desktop presentation tool. Good color schemes. ♦♦♦♦ Can send presentations to Genigraphics to produce color 35mm slides. Version 2.0. Requires System 4.1 or later, 1 megabyte and two 800K drives or hard disk. $395. Microsoft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-9717. NCP (Aug '87)

The Print Shop makes it easy to create greeting cards, signs, banners, and ♦♦♦½ letterhead. Uses its own special graphics and can import Paint files. Hard-disk users get version 1.02 or later. $79.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903. CP (Sept '87)

Space Edit is a 3-D CAD program. Display shows top, front, side, and axonometric ♦♦♦½ views of an object, all at once or one at a time. Has standard CAD features plus zoom, exploded view, animated flyover. Suppression of hidden lines is very slow. Requires 1 megabyte +. $625. Abvent, 9903 Santa Monica Blvd., Beverly Hills, CA 90212. CP (July '87)

StandOut! is a presentation program built like a publishing program, with strong ♦♦♦♦ text and graphics support. Automatic text flow around graphic objects. Lacks good graphic examples. Version 1.0. Requires 1M and two 800K drives or hard disk. $395. Letraset, 40 Eisenhower Drive, Paramus, NJ 07652. NCP (Nov '88)

Studio/8 is a professional-level color paint application for the Mac II. Superior tool ♦♦♦♦♦ set, elegant interface, excellent performance, and speed. Version 1.0. Requires Mac II and hard disk; 2 megabytes of RAM recommended. $495. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. NCP (Jan '89)

SuperPaint is a powerful, easy-to-use graphics program with all the best features ♦♦♦♦½ of MacPaint and MacDraw — and then some. LaserBits provides 300 dpi magnification and there are 40 editable brush shapes. Requires 512K+. $149.95. Silicon Beach Software, 9580 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126. NCP (Feb '87) ★'87 Eddy

Super 3D is a high-power 3-D modeling program with an excellent integrated ♦♦♦♦♦ interface. Powerful time-saver. Features include animation, import/export of 3-D worlds as text files. Excellent for art, design, or technical work. Version 1.0. Requires 1M. $295. Silicon Beach Software, 9580 Black Mountain Road, P.O. Box 261430, San Diego, CA 92126. NCP (Jan '88).

Trapeze is a powerful presentation worksheet that combines mathematical func- ♦♦♦♦½ tions and graphic representation. The interface, which consists of an icon bar, can be awkward to use. Mac II and color supported. Version 2.0. $395. Access Technology, 555C Heritage Harbor, Monterey, CA 93940. NCP (Dec '87)
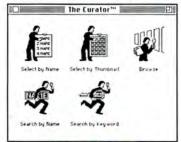
TrueForm takes a scanned image of a paper form and turns it into an electronic ♦♦♦♦½ equivalent, complete with fields for entering data. It can automatically sum numeric fields. Requires external 800K drive. $495; run-time version, $295. Spectrum Digital Systems, 2702 International Lane, Madison, WI 53704-3122. NCP (May '88)

VersaCAD is a powerful CAD program that doesn't show any of its MS-DOS roots. ♦♦♦♦ Excellent element manipulation, full plotter support. Library user interface is crude. Requires 1 megabyte +. $1,995. VersaCad, 2124 Main St., Huntington Beach, CA 92648. NCP (July '88)

MINIFINDERS

VideoWorks II is an easy-to-use animation tool — the best available on the Mac.
★★★★½ Has an Overview mode that acts as a slide show carousel for presentations. Works in color on the Mac II. $195. Requires 1 megabyte + and an 800K drive. MacroMind, 1028 W. Wolfram, Chicago, IL 60657. NCP (Mar '88) ★'85, '87 Eddy

VideoWorks II Accelerator compiles VideoWorks II movies to make them run
★★★★ more smoothly. Compensates for the QuickDraw screen display. Version 1.0. Requires 1 megabyte, VideoWorks II; hard-disk drive recommended. $195. MacroMind, 1028 West Wolfram, Chicago, IL 60657. NCP (Dec '88)

VideoWorks II Clip Animation, Clip Charts, Black and White Movies, and Clip
★★★★ Sounds are four separate aids to help you construct movies and business presentations. Requires VideoWorks II. $49.95 to $59.95. MacroMind, 1028 W. Wolfram, Chicago, IL 60657. NCP (Aug '88)

WetPaint consists of two three-disk volumes of very high quality clip art. Also
★★★★★ includes the Art Roundup DA, a good art browser/editor. Volume 1 or 2, $39 each; both volumes, $59. Available in PictureBase format for $15 extra per volume. Dubl-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Sept '87)

World-Class Fonts! comes in two volumes of three disks each. Includes all the
★★★★½ Mac the Knife fonts and a lot more, including two useful utilities. This is now the best collection of ImageWriter fonts available. Each volume: $39; both volumes: $59. Dubl-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Dec '86)

DESKTOP PUBLISHING

Interleaf Publisher is a speedy multiuser layout system for producing large, com-
★★★½ plicated documents. Has strong global formatting ability but can't use downloadable fonts. Requires Mac II with 5 megabytes of RAM and 40-megabyte hard disk, $2,495. Interleaf, 10 Canal Park, Cambridge, MA 02141. NCP (May '88)

JustText is a professional-level word processor and page makeup program that
★★★½ generates PostScript output. Comes with a set of LaserWriter utilities that allow total manipulation of art and text. Requires LaserWriter or other

PostScript compatible output device. $195. Knowledge Engineering, G.P.O. Box 2139, New York, NY 10116. NCP (Dec '85)

MacTEX is the TeX environment of choice for hardcore TeX users on the Macin-
★★★½ tosh. Very intimidating for others. Painfully slow and visually unattractive. Version 2.0. Requires 1 megabyte +. $750. FTL Systems, 234 Eglinton Ave. East, Toronto, Ontario M4P 1K5, Canada. NCP (Apr '88)

PageMaker retains its paste-up approach to page layout. New features include
★★★★★ auto text flow, style sheets, and spot color support. The standard keeps getting better. Version 3.0. Requires 1 megabyte +, and a hard disk. $595. Aldus, 411 First Ave. South, Seattle, WA 98104. NCP (Aug '88) ★ '85, '87 Eddy

Portfolio: Designs for Newsletters provides more than 20 templates for two-
★★★★ page newsletters with preset columns, headlines, graphics, and captions. Documentation provides excellent tutorial in page design. Requires 512K+; PageMaker. $79.95. Aldus, 411 First Ave. S., Suite 200, Seattle, WA 98104. NCP (May '87)

QuarkXPress is a powerful page-layout program, with 24-bit color, style sheets,
★★★★½ and search and replace of text attributes. Also does four-color separations. Layout is done using text and picture boxes, which improves control but is difficult to master. Version 2.0. Requires more than 1 megabyte as well as a hard disk. $795. Quark, 1983 Landings Drive, Mountain View, CA 94043. CP until registered. (Jan '89)

Ragtime is an "Integrated Page Processor" with text, graphics, and built-in
★★★★ spreadsheet. Flow text automatically from one frame to another. Spreadsheet has a full set of functions. Excellent, easy-to-use program. Requires 512K+. $395. Orange Micro, 1400 N. Lakeview, Anaheim, CA 92807. NCP (Aug '88)

Ready, Set, Go! 4 has an elegant interface and excellent manual. Powerful text
★★★★½ wraparounds, fast word processor with hyphenation and spelling check and custom stylesheets. Requires 1 megabyte +. $495. Letraset, 40 Eisenhower Drive, Paramus, NJ 07652. NCP (Feb '88) ★'86 Eddy

TeXtures is an implementation of TeX, the big daddy of typesetting programs.
★★★ Good for people trained on mainframes in the early days. Otherwise very sticky with a high learning curve. Version 1.0. Requires 512K+. $495.

These unretouched print samples show the superior print quality of QMS-PS 810 over printers using first-generation print engines.

ntroducing the PostScript laser printer that blacks out at high speeds.

The new QMS-PS® 810 can compose and print the most complex pages in record times, with richer, more saturated blacks than ever before. All with the desktop publishing power of Adobe PostScript®, and the superior print know-how of QMS, an industry leader.

Under the hood QMS ASAP™ (Advanced System Architecture for PostScript) is proprietary technology that helps eliminate the hardware bottlenecks that hinder other PostScript printers. As a result, QMS-PS 810 boasts processing speeds remarkably faster than other PostScript printers in its class. And faster output means greater productivity. In addition, the QMS-PS 810 laser printer's new Canon® SX® print engine covers solid areas and prints fine detail better than previous-generation engines.

The new 8-page/minute QMS-PS 810 laser printer

Fast start, strong finish You can adorn your documents with one or all of the 35 Adobe typefaces. Thanks to PostScript, there's an infinite number of font variations available. You can also make type as large or as small as you want. And put it anywhere on the page. In fact, with PostScript you enjoy total control over the design of your page. It gives you the complete desktop publishing power to do things that would otherwise be virtually impossible. So you get high-quality output exactly how you want it.

Along with PostScript, the HP LaserJet+™, Diablo® 630 and HP-GL™ printer emulations are added for your non-PostScript software.

The QMS-PS 810 laser printer is easy to use, maintain, and comes with a one-year warranty. It's available from Laser Connection dealers. Laser Connection is a sales and marketing subsidiary of QMS. For the dealer nearest you call **1-800-523-2696** .

LASER CONNECTION™

A QMS® company

MINIFINDERS

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TOPS is a file server designed to network computers with different operating ‡‡‡‡½ systems. Supports Macs, MS-DOS compatibles, and UNIX. Access to files and subdirectories is transparent to the user; they appear as Mac folders. Only handles ASCII or Text files. $249 for Mac version. TOPS, 950 Marina Village Parkway, Alameda, CA 94501. Serial number protected. (May '87) ★'87 Eddy

VersaTerm-Pro is a very powerful terminal program with several special features. ‡‡‡‡½ Does one of the best VT100 emulations available and specializes in high-quality Tektronix 4014 and 4105 emulation. A pro's tool. Requires 512K+. $295. Peripherals, Computers & Supplies, 2457 Perkiomen Ave., Mount Penn, PA 19606. NCP (Apr '87)

WORD PROCESSORS

Document Compare allows users to compare any two MacWrite 4.5, ASCII, or ‡‡‡ MDS documents. Differences in spelling, punctuation, formatting, and wording are detected. Documents can be printed out with differences highlighted. $99. Legalware, 33 Young St., Toronto, Ontario M5E 1S9, Canada. NCP (May '86)

Document Modeler can automate much of a professional office's correspon- ‡‡‡‡½ dence. Comes in two parts: Template Maker and Document Maker. Initial setup requires time and is complex. $299.95. Legalware, 33 Young St., Toronto, Ontario M5E 1S9, Canada. NCP (Mar '87)

Doug Clapp's Word Tools is a useful punctuation and style-editing program. It ‡‡‡‡ won't turn you into a Proust, but it will help you make your writing cleaner and clearer. Word counts among different formats show discrepancies, but not to worry. Requires 512K+. $79.95 Aegis Development, 2125 Pico Blvd., Santa Monica, CA 90405. NCP (Sept '87)

Expressionist is a powerful DA that allows you to create complex mathematical ‡‡‡‡‡ equations from within an application. Equation manipulation has never been easier. $79.95. Allan Bonadio Associates, 1579 Dolores St., San Francisco, CA 94110. NCP (July '87)

FullWrite Professional combines outlining and word processing with page layout ‡‡‡‡ and drawing. Its many features translate into sluggish performance unless you have a lot of extra RAM. Impressive. Version 1.0. Requires 1 megabyte. Mac II and MultiFinder friendly. $395. Ashton-Tate, 20101 Hamilton Ave., Torrance, CA 90502. NCP (Sept '88)

Graham Speller is a desk accessory-based spelling checker. Includes macro ‡‡‡ feature. Good guesser in interactive mode. Clumsy interface. Version 1.1. $44.95. Graham Software, 8609 Ingalls Circle, Arvada, CO 80003. NCP (Sept '88)

Kadmos Greek Font is a full character set of ancient Greek that prints on any ‡‡‡½ PostScript printer. Requires learning new typing skills, but excellent quality makes it worth the effort. $85. Allotype Typographics, 1600 Packard Road, Ann Arbor, MI 48104. NCP (Oct '87)

Laser Author is a high-powered, technically oriented word processor. Good math- ‡‡‡½ setting capability. Has style sheets, word count, and page layout capability. $199.95. Firebird Licensees, P.O. Box 49, Ramsey, NJ 07446. NCP (Mar '87)

Liberty Spell Checker is a fast, effective, interactive checker. The dictionary is ‡‡‡½ smaller than average, but well chosen. Unfortunately, it has a few mis-spelled words. $59.95. DataPak, 14011 Ventura Blvd., Sherman Oaks, CA 91423. CP (Oct '86)

Lookup is an on-call, quick, single-word spelling checker. Designed for the way ‡‡‡‡‡ writers really work. Uses the 93,000+ word Spellswell dictionary. $49.95. Working Software, 321 Alvarado, Suite H, Monterey, CA 93940. (Dec '87) NCP

MacGAS is a DA spelling checker with both a small and extended dictionary. Its best ‡‡‡ point is the excellent thesaurus. Provides antonyms and glossary. A slow checker. $99. EnterSet, 2380 Ellsworth, Berkeley, CA 94720. CP (Oct '86)

MacProof is a grammar, style, and spelling checker that's like having your own ‡‡‡‡½ personal copy editor. Grammar rules are fixed, and you may not agree with the choices. The program only suggests corrections, it doesn't make them for you. And the checking process can be slow if your document is long. $195 for stand-alone version; $2,500 for networked version. Automated Language Processing Systems, 190 W. 800 North, Provo, UT 84604. NCP (Apr '87)

Macspell+ is a spelling checker that installs as a desk accessory. Works easily ‡‡‡‡ with MacWrite 4.5 and 2.2 and Word, but has some drawbacks. New version 1.10 just available. Requires 512K+, two drives or hard disk. $99. Creighton Development, 16 Hughes St., Irvine, CA 92718. NCP

MINIFINDERS

MacWrite is starting to show its age. While still a good, basic program, it's out-
★★★ performed by its competition. Probably enough for the occasional user.
Version 5.0 includes command key equivalents and spelling checker.
Requires 512KE+. $125. Claris, 440 Clyde Ave., Mountain View, CA
94043. NCP (June '88) ★'85 Eddy

MergeWrite is a mail-merge program for MacWrite (also works with ASCII files).
★★★½ Program combines names and addresses from a data file into predefined
fields in a form letter. Also allows simple conditional IF-THEN-ELSE equa-
tions. $49.95. Software Discoveries, 137 Krawski Drive, South Windsor,
CT 06074. NCP (Dec '87)

MindWrite integrates outlining and word processing better than anyone. Version
★★★★ 1.1 fixes many problems of the earlier version. Sophisticated search and
select options. Unimpressive speed. $295. Access Technology, 555C
Heritage Harbor, Monterey, CA 93940. NCP (Feb '88)

QUED/M is an excellent text editor that saves documents in a form readable by most
★★★★½ computers and printers. Doesn't support graphics or multiple fonts. Pro-
gramming language allows creation of database. Version 2.01. $129. Para-
gon Concepts, 4954 Sun Valley Road, Del Mar, CA 92014. NCP (Mar '88)

Scriptor is designed for producing standard-format scripts. Starts with a Word
★★★½ document. As you change your Word document, Scriptor will reformat,
renumber, and reprint the script. Supports LaserWriter and daisywheel
printers. $295. Screenplay Systems, 348 E. Olive Ave., Suite F, Burbank,
CA 91502. NCP (May '87)

Sensible Grammar corrects some of the more glaring errors that writers make. Also
★★★ analyzes the word count and structure of sentences to come up with a
readability rating. Slow. Version 1.1d. Requires 512K. $99.95. Sensible
Software, 335 E. Big Beaver, Suite 207, Troy, MI 48083. NCP (Dec '88)

Spelling Champion is a fast and accurate batch-type spelling checker. Back-up
★★★★ feature allows you to undo corrections in a paragraph. Works only with
MacWrite 4.5. $39.95. Champion Software, 6617 Gettysburg Drive,
Madison, WI 53705. NCP (Oct '86)

Spelling Coach Professional is a desk accessory and stand-alone spelling check-
★★★★½ er as well as thesaurus. Includes dictionary definitions. Off-the-wall pho-
netic guesses. Version 3.0. $195. Deneba Software, 7855 N.W. 12th
Street, Suite 202, Miami, FL, 33126. NCP (Sept '88)

Spellswell is a stand-alone batch spelling checker. Also checks for punctuation
★★★★½ and other errors. Good dictionary, thorough checking, simple interface.
Weak guessing. Version 2.0. $74.95. Working Software, P.O. Box 1844,
Santa Cruz, CA 95061. NCP (Sept '88) ★'86 Eddy

Thunder! is a desk accessory spelling checker. Includes macro features. Fairly
★★★★½ fast, good guessing of misspelled words. Small dictionary. MultiFinder
hostile. Version 1.1. $49.95. Electronic Arts, 1820 Gateway Drive, San
Mateo, CA 94404. NCP (Sept '88)

Word Finder is an electronic thesaurus that won't replace your trusty Roget's, but
★★★½ is still useful for checking synonyms on the fly. Large, respectively. Ver-
sion 2.0. Requires 512K. Mac II and MultiFinder friendly. $59.95. Micro-
lytics, 300 Main St., Rochester, NY 14445. NCP (Sept '88)

Word 3.02 is the most feature-laden word processor around. Also has Microsoft's
★★★★½ somewhat unusual view of what the Mac interface is. Esoteric command
key combinations. Requires 512K+. $395. Microsoft, 16011 N.E. 36th
Way, Redmond, WA 98073. NCP (Mar '88)

WorksPlus Spell is a speedy spelling and hyphenation checker for Microsoft
★★★★½ Works. It includes a glossary for abbreviations and time/date stamping.
The biggest drawback is its limitation to one program. $59.95. Lundeen
& Associates. P.O. Box 30038, Oakland, CA 94604. NCP (Oct '87) ★'87
Eddy

Write is a ''beginner's'' version of Word 3.0. More features than some word
★★★ processors in its class, but not all of the features work well. Poor value,
and expensive upgrade path to Word. $175. Requires 512K+. Micro-
soft, 16011 N.E. 36th Way, P.O. Box 97017, Redmond, WA 98073-
9717. NCP (May '88)
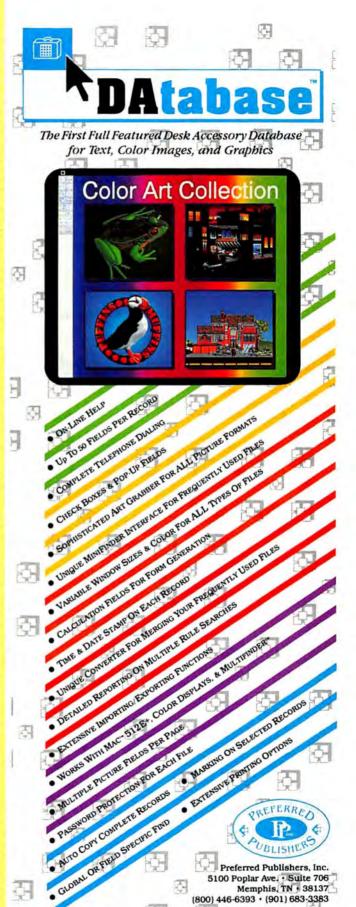
WriteNow for the Macintosh has many of the features of MacWrite and then
★★★★½ some, including the ability to work in columns. Has built-in spelling check-
er with 50,000-word dictionary. $175. T/Maker, 1973 Landings Drive,
Mountain View, CA 94043. NCP (Mar '87)

SYSTEM SOFTWARE

HyperCard is a totally unique program for the Mac. It uses an index-card metaphor
★★★★ and it contains a programming language, HyperTalk. Requires 1 mega-
byte +. Free with new Macs and bundled with many HyperCard stacks,
otherwise $49.95. Apple Computer, 20525 Mariani Ave., Cupertino, CA
95014. NCP (Dec '87) ★'87 Eddy

SoftPC puts an IBM PC/XT inside your Mac without cracking the case to add any
★★★½ special coprocessor boards. The emulation of an MS-DOS machine is
done entirely in the software. Version 1.2. Requires Mac II or SE equipped
with 68020 accelerator card; 2 megabytes of RAM. $595. Insignia Solu-
tions, 1255 Post St., Suite 625, San Francisco, CA 94109. NCP (Nov '88)

System Tools 5.0 is the Apple System upgrade for Mac Plus, SE, and II owners. It
★★★★ contains MultiFinder (a multitasking environment), a LaserWriter spooler,
and a Control Panel resource to add color on the Mac II desktop. Requires

MINIFINDERS

1 megabyte +. $49. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP (Mar '88)

System Tools 6.0 contains an improved version of MultiFinder and new features ♦♦½ like CloseView (for visually impaired users), Map, and MacroMaker. Incompatible with many programs; lots of small bugs. Requires 1 megabyte. $49. Apple Computer, 20525 Mariani Avenue, Cupertino, CA 95014. NCP (Nov '88)

HYPERCARD

Business Class is a HyperCard stack that contains world travel information and ♦♦♦½ itinerary planning. Uses maps to locate countries of interest, but it lacks United States domestic travel information. Requires 1 megabyte + and HyperCard. $49.95. Activision, 3885 Bohannon Drive, Menlo Park, CA 94025. NCP (Mar '88)

City to City imparts travel information on 31 U.S. cities including details on hotels, ♦♦♦♦ restaurants, and nightlife. Helps plan an itinerary. Requires HyperCard, two disk drives, and a printer. $49.95. Activision, 3885 Bohannon Drive, Menlo Park, CA 94025. NCP (Sept '88)

Focal Point is a HyperCard stack that ties together a calendar, phone log, client ♦♦♦♦½ accounts, and more in one easy-to-use organizational tool. Requires 1 megabyte + and HyperCard. $99.95. Activision, 3885 Bohannon Drive, Menlo Park, CA 94025. NCP (Mar '88)

HyperAtlas is a collection of U.S. and World maps that are networked to stacks ♦♦♦ containing economic, political, and population data. Version 1.0. Requires HyperCard and second disk drive or hard disk. $99. MicroMaps Software, P.O. Box 757, Lambertville, NJ 08530. NCP (Oct '88)

HyperDA lets you browse through HyperCard stacks through a desk accessory. A ♦♦♦♦ true equalizer for 512K Mac owners who cannot normally access stackware. Doesn't support global variables. Requires 512K +. $69. Symmetry, 761 E. University Drive, Mesa, AZ 85203. NCP (May '88)

HyperTutor is a stack that teaches HyperTalk, Hypercard's programming lan- ♦♦♦♦½ guage. Uses an interactive Test Mac on each card to write scripts. A variety of windows makes it good for both beginners and advanced programmers. $49.95. Channelmark, 2929 Campus Drive, San Mateo, CA 94403. NCP (Apr '88)

Reports endows HyperCard stacks with the power to sort and impart information ♦♦♦½ like a database. Customizing reports is difficult. Requires HyperCard. $99.95. Activision, Inc., 3885 Bohannon Drive, Menlo Park, CA 94025. NCP (Aug '88)

ScriptExpert helps you generate HyperTalk scripts by leading you through the ♦♦♦♦ correct use of the language. Select a common command, and dialog boxes prompt you for necessary components. Version 1.0. Requires HyperCard. $79.95. Hyperpress Publishing, P.O. Box 8243, Foster City, CA 94404. NCP (Oct '88)

VideoWorks II HyperCard Driver lets you play movies directly from a stack. One ♦♦♦½ way to add color animation to HyperCard. Version 1.0. Requires 1 megabyte, VideoWorks II, and HyperCard; hard-disk drive recommended. $99.95. MacroMind, 1028 West Wolfram, Chicago, IL 60657. NCP (Dec '88)

ORGANIZATIONAL TOOLS

Acta is an outline processor in desk accessory format. It has practically all the ♦♦♦♦½ power of a stand-alone program, and then some. Can save files as Acta outlines, MacWrite files, or text files. Version 2.0. $79. Symmetry Corporation, 761 E. University Drive, Mesa, AZ 85203. NCP (Oct '88)

Comment is an electronic version of Post-it Notes. A mini-word processor lets ♦♦♦♦ you attach notes to a spreadsheet cell, to words in a text document, or to a window on the desktop. Version 2.0. Requires 512KE. $99.95. Deneba Software, 3305 N.W. 74th Ave., Miami, FL 33122. NCP (Dec '88)

Design is a powerful organizational tool. It goes beyond mere flowcharting. Graphi- ♦♦♦♦½ cally depicts relationships between systems. Complex, detailed program aimed at software pros. $250. Meta Software, 150 Cambridge Park Drive, Cambridge, MA 02140. NCP (Apr '88)

FamilyCare is a "yuppie" handbook to childhood diseases. The rule-based expert ♦♦♦ system gives advice based on symptoms. Ailments and diseases run the gamut from acne and appendicitis to wheezing and yeast infections. Lacks graphics. Version 1.0. Requires 512K. $99. Lundin Laboratories, 29451 Greenfield Road, Southfield, MI 48076. Mac II and MultiFinder friendly. NCP (Sept '88)

FlowMaster charts your ad dollars in print, TV, billboard, and other mediums. ♦♦♦♦♦ Analyzes cost/benefit of a campaign in terms that even jaded Mad. Ave. execs will find innovative. Includes bar-chart and tabular output. Requires 512K +. $495. Select Micro Systems, 40 Triangle Center, Yorktown Heights, NY 10598. NCP (Jan '88)

FormSet: Business Forms Edition brings a wealth of business forms, such as ♦♦♦ expense reports and profit/loss statements, into the electronic arena. Fields are automatically calculated. Can't be customized beyond adding

MINIFINDERS

logo. Version 1.0. Requires 512KE and two 800K floppy drives or hard disks. $95. SoftView, 4820 Adhor Lane, Suite D, Camarillo, CA 93010. NCP (Jan '89)

GeoQuery puts your database on the map by accessing zip code information. ★★★★ Comes with maps of the U.S. Other atlases available. Version 1.0 reviewed. Requires 1 megabyte + and second disk drive. $349. Odesta, 4084 Commercial Avenue, Northbrook, IL 60062. NCP (July '88)

Guide allows you to "cross reference" from within a document using hypertext. You ★★★★½ can set up words or sections of the document so that double-clicking brings up explanatory material, graphics, and other useful items. The word processing and formatting functions, however, are limited. $135. OWL International, 14218 N.E. 21st St., Bellevue, WA 98007. NCP (Apr '87)

Inspiration's flowcharting tools let you free-associate ideas visually, then auto-★★★ matically dump the flowchart into a text outline. Version 1.0. Requires 512KE and an 800K drive or a hard-disk drive. $149. Ceres Software, 9498 S.W. Barbur Blvd., Suite 103, Portland, OR 97219. NCP (Dec '88)

Instant Expert is an excellent way to learn the mechanics of creating an expert ★★★½ system. The inference engine (that ultimately finds the answer) is visible. Lacks a true Mac interface. Version 1.0. $49.95. Human Intellect Systems, 1670 S. Amphlett Blvd., Suite 326, San Mateo, CA 94402. NCP (Jan '88)

MacProject allows a user to plan and track a project from beginning to end. Uses ★★★ CPM to produce schedules with start and finish dates for each task. Can report on resource interdependencies and generate all needed printed reports. $195. Claris, 440 Clyde Ave., Mountain View, CA 94043. NCP (Mar '86)

MacSMARTS can create small, stand-alone expert systems. Features hypertext ★★★ connections to Paint, PICT, SYLK, and text files. Still a little buggy. Version 1.03. Requires 512K+. $149.95. Cognition Technology, 55 Wheeler St., Cambridge, MA 02138. NCP (Jan '88)

Microsoft Works is an integrated application that includes word processing, ★★★★½ database, spreadsheet, and telecommunications functions. The telecommunications module includes both background up- and downloading. $295. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. NCP (Oct '86) ★'86 Eddy

MORE is an incredibly powerful outline processor with gobs of great features: ★★★★★ instant charts, math capabilities, multiple windows, font and style control, templates, and more. Prints outlines in any of several standard formats, even in color. Requires 512K+. $395. Symantec, 117 Easy St., Mountain View, CA 94043. NCP (Jan '87) ★'86 Eddy

QuickDex keeps your phone numbers in an electronic Rolodex. The desk accesso-★★★★½ ry even plays the tone through the Mac's sound port. Version 1.4a. Requires 512KE; hard disk is recommended. $60. Casady & Greene, P.O. Box 223779, Carmel, CA 93922. NCP (Jan '89)

STELLA for Business is a simulation tool used to model complex business sys-★★★★½ tems. Requires that you master a discipline called "system dynamics." Requires 512K+. Mac II version available. $350. High Performance Systems, 13 Dartmouth College Highway, Lyme, NH 03768. NCP (June '88)

SuperExpert is an expert system shell that induces rules from examples. ★★½ Rules become unwieldy when many criteria and examples are used. Overpriced. Version 1.4 reviewed. Requires 512KE. $199.95. Softsync, 162 Madison Avenue, New York, NY 10016. NCP (July '88)

UTILITIES
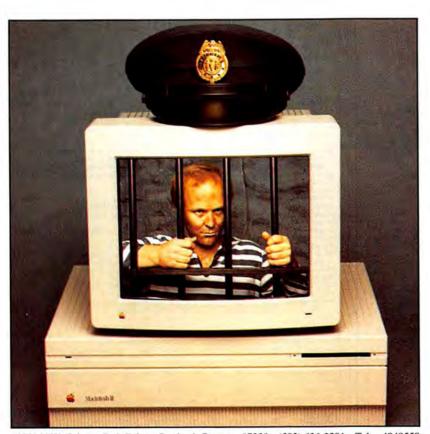
AutoSave DA is insurance against system crashes. It saves your work automati-★★★ cally at intervals from 1 to 99 minutes. Compatible with many applications, but not recommended for use with databases. $49.95. Magic Software, 1706 Galvin Road S., Bellevue, NE 68005. NCP (Jan '88)

CalendarMaker creates monthly calendars in a variety of formats. Users can ★★★★½ incorporate their art and daily notes. Note files can be imported from a variety of DA calendars and outliners. Shareware and prelicensed versions available. $49.95. CE Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Dec '86)

Capture saves any portion of a Macintosh screen to the Clipboard or as a PICT file. ★★★★★ Works in color on the Mac II. Requires 512K+. MultiFinder friendly. $59.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (June '88)

MINIFINDERS

Colorizer adds pigments to the desktop and black-and-white applications. Also ‡‡‡ colors PICT graphics. System resources include saving and printing color screens. A useful novelty that'll run its course as developers add color to apps. Requires Mac II. $49.95. Palomar Software, P.O. Box 2635, Vista, CA 92083. NCP (Jan '88)

Copy II Mac does efficient sector and bit copies and in its latest version can back ‡‡‡‡‡ up virtually all Mac software. Features graphic displays of copy progress. Comes with MacTools, a multi-use utility that can recover many damaged files. $39.95. Central Point Software, 9700 S.W. Capitol Highway, Portland, OR 97219. NCP (Apr '86) ★'85 Eddy

DiskExpress optimizes hard-drive performance by reorganizing fragmented files. ‡‡‡‡‡ Best of its kind. Version 1.5. Requires 512K. $49.95. ALSoft, P.O. Box 927, Spring, TX 77383. NCP (Jan '89)

DiskFit is a utility for backing up and restoring hard disk files. Creates a "Smart-‡‡‡‡½ Set" of floppy disks so incremental back-ups only update files modified since the last back-up procedure. Backs up to floppies or another hard disk. Requires 512KE+. $99.95. SuperMac Software, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (June '87)

DiskQuick is an easy-to-use cataloging program. Criteria selection option for ‡‡‡‡ generating subcatalogs. Requires 512K+. $49.95. Ideaforms, P.O. Box 1540, Fairfield, IA 52556. NCP (Apr '87)

Disk Ranger is a speedy cataloging program that doubles as an efficient label-‡‡‡‡ maker. Comes with pinfeed labels. Works with regular and hard disks. Can catalog HFS systems. $34.95. Graham Software, 8609 Ingalls Circle, Arvada, CO 80003. NCP (Mar '86)

DiskTools Plus is a set of eight useful DAs and applications. Earlier version was ‡‡‡‡‡ sold as Battery Pak. The DA Disk Tools II is a Finder replacement. Also included are an RPN calculator, Phone Pad, and Calendar Manager. Requires 512K+. $49.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. NCP (Mar '88)

DiskTop is a desk accessory Finder replacement of extraordinary power and ease ‡‡‡‡½ of use. Comes with the useful LaserStatus DA and Widgets application. The extras alone are worth the price. Requires 512K+. Upgrade from version 1.0, $7; $10 with new manual. $49.95. CE Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Aug '87)

Dubl-Click Calculator Construction Set lets users design personalized calcula-‡‡‡‡½ tors with a variety of standard and special functions. Finished calculators can be saved as installable desk accessories or as clickable applications. $59. Dubl-Click Software, 18201 Gresham St., Northridge, CA 91325. NCP (Apr '86)

Eureka: The Solver is a free-form numerical equation solver. Standard trigono-‡‡‡ metric and logarithmic functions are available, as is treatment of imaginary and complex numbers. $195. Borland International, 4585 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Mar '88)

Fastback for the Macintosh is hard disk back-up software that is very quick, if not ‡‡‡ very efficient. Doesn't automatically exclude applications. Creates a separate catalog disk. $99.95. Fifth Generation Systems, 1322 Bell Ave., Tustin, CA 92680. NCP (Apr '88)

FEdit Plus is the file and disk editor for everyone, from newest Mac owner to ‡‡‡‡‡ oldest. It can do more for your disks and files than any other application. Can recover deleted MFS files. If you own a Mac, get it. HFS-compatible. $49.95. MacMaster Systems, 108 E. Fremont Ave., #37, Sunnyvale, CA 94087. NCP (Sept '86) ★'86 Eddy

Findswell is an indispensible utility that installs a new button in the Open Dialog ‡‡‡‡‡ box of virtually every Macintosh application. Press the button, type a search string, press Find, and Findswell searches for any files that match. Click Open or double-click to open the correct file. Requires 512K+. $49.95. Working Software, P.O. Box 1844, Santa Cruz, CA 95060. NCP (Nov '87) ★'87 Eddy

1stAid Kit HFS recovers lost or damaged files from floppy or hard disks. An ‡‡‡‡½ excellent manual-turned-textbook actually teaches the Hierarchical File System. Requires 1.2 reviewed. $99.95. 1st Aid Software, 42 Radnor Road, Boston, MA 02135. NCP (June '88)

FlashBack is a utility to back up HFS hard disks onto floppies. A unique graphic ‡‡‡ display of the HFS directory facilitates file selection. The program can handle files larger than 800K. $59.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Nov '86)

Font/DA Juggler Plus gives you unlimited access to almost any number of fonts, ‡‡‡‡ desk accessories, and sounds. Uses hierarchical menus. $59.95. ALSoft, P.O. Box 927, Spring, TX 77383. NCP (May '88)

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Glue adds a print-to-disk capability to many programs. ImageSaver installs as printer driver; Viewer allows copying and printing of Glue files. Handy utility for desktop publishers. $59.95. Solutions International, P.O. Box 989, Montpelier, VT 05602. NCP (Dec '86)

Hard Disk Util uses patch files to allow users to mount and run specified programs on their hard disks. The list of patches is constantly expanding. $89.95. FWB Software, 2040 Polk St., San Francisco, CA 94109. NCP

HFS Backup ranks as one of the preferred hard disk back-up utilities. Back up by file/folder or last changes. Back-up specifications can be saved as templates. Good graphic interface. Reliable program. $49.95. PCPC, 4710 Eisenhower Blvd., Tampa, FL 33634. NCP (Dec '86)

HFS Locator Plus is *the* essential HFS desk accessory. It can search for a file by name or date of creation, create folders, move files from one folder to another, set a program to launch while in an application. $39.95. PBI Software, 1163 Triton Drive, Foster City, CA 94404. NCP (Sept '86)

Icon-It! lets you create icons to use as an alternative to menu commands. Comes with 47 icon templates or you can create your own. Version 1.0. $79.95. Olduvai Software, 7520 Red Road, South Miami, FL 33143. NCP (Feb '88)

LabView is a graphical programming environment that creates ''virtual instruments'' to perform calculations, acquire laboratory data, and control instrumentation. Slow. Version 1.1 reviewed. $1900. National Instruments, 12109 Technology Blvd., Austin, TX 78727-6204. NCP (July '88)

LaserServe is a printer spooler for AppleTalk networks. After installation all operations are done via a desk accessory. Works with both MacServe and TOPS. Requires 512K+ and 800K drive or hard disk. $95 per node. Infosphere, 4730 S.W. Macadam Ave., Portland, OR 97201. NCP (Feb '87)

Mac Disk Catalog II is a utility that will quickly organize a moderate-size disk library. Easy to use with powerful reporting and label-making features. $49.95. New Canaan MicroCode, 136 Beech Road, New Canaan, CT 06840. NCP (Dec '85)

MacFlow is a design tool created for programmers. Traditional flowcharting symbols are linked together, and a symbol can be connected to a separate flowchart file. Now supports custom symbols. $125. Mainstay, 5211-B Derry Ave., Agoura Hills, CA 91301. NCP (Apr '87)

MacInUse tracks time spent in applications and saves info as text files. Installs on any disk, works in background. MFS, HFS compatible. Extremely valuable for tax purposes, client records, etc. $79. SoftView, 4820 Adohr Lane, Camarillo, CA 93010. NCP (Jan '87) ★'86 Eddy

MacLabeler lets users instantly index and print labels for all the disks in a burgeoning collection. Choose border type and orientation of your label; index by folder or document. Starter set of labels is included. $49.95. Ideaform, P.O. Box 1540, Fairfield, IA 52556. NCP (Prem)

MacNosy is a global disassembler. A very advanced user can use this program to look into the code of virtually any program. This advanced tool can take you places no other Mac program could dream of going IF you have the skill to guide it. The documentation is sparse. For pros only. $170, SE and Plus; $350, Mac II. Jasik Designs, 343 Trenton Way, Menlo Park, CA 94025. NCP

MacSafe is a data file security program that allows you to place multiple files into a ''safe,'' and then you can further protect them through two types of encryption (including DES). Flexible and very easy to use. Allows for installation on hard disk. $149.95. Kent Marsh Ltd., 1200 Post Oak Blvd., Houston, TX 77056. CP (Mar '87)

MacServe converts a Mac and a hard disk into a disk and print server. Uses the AppleTalk network and is easily hooked up. Users can partition the hard disk into multiple volumes. Runs in the background, so users can work on all machines in the network. $250. Requires 512+. Infosphere, 4730 S.W. Macadam, Portland, OR 97201. CP

MacTree displays your files in the form of a hierarchical tree. Good idea, poor performance. Can't view tree easily. Good search function. Requires 512K+. $69.95. Software Research Technology, 22901 Mill Creek Drive, Laguna Hills, CA 92653. NCP (Apr '88)

MacZap is a three-part disk and memory utility. It can be used to recover some damaged files and disks, compare disks, analyze disk structure, and make back-up copies of most disks. $60. Micro Analyst, 2505 Roxmoor, Austin, TX 78723. NCP (Jan '86)

Menu Fonts displays the names of fonts in the actual font instead of standard Chicago. Won't work with programs that have a nonstandard Font menu or no Font menu. Comes with LockOut, a utility that gives password

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MINIFINDERS

access to your Mac, and FastFormatter, a utility for formatting multiple blank disks. Requires 512K+. $15. Beyond Software, 6069 E. Grant Road, Tucson, AZ 85712. NCP (July '87)

MockPackage+ is a set of extremely powerful DAs. Includes a text editor, text ‡‡‡‡½ printer (supports LaserWriter), charter, terminal, and EZmenus. HFS compatible. $35. CE Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Mar '87)

myDiskLabeler is an excellent label maker. It can read directories and use large or ‡‡‡‡ small icons or anything desired. Comes with 54 precut labels. $44.95; with color printing ability (on the ImageWriter II), $54.95; with PostScript font capability (on the LaserWriter), $64.95. Williams and Macias, P.O. Box 19206, Spokane, WA 99219. NCP (Aug '87)

'Ncryptor is a simple, safe program that lets users password-protect their files. ‡‡‡‡ The same program is used for encoding and decoding. This is one of the best products in its category. $39.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP

NightWatch locks up your hard disk by using a floppy start-up disk that acts as a ‡‡‡‡½ key. Type in the correct password, and access to the hard disk is allowed. Version 1.02. Requires 512KE, a hard disk, and an 800K drive. Mac II and MultiFinder friendly. $149.95. Kent Marsh Ltd., P.O. Box 460289, 1200 Post Oak Blvd., Suite 210, Houston, TX 77056. NCP (Sept '88)

On Cue lets you switch applications without returning to the Finder. Under Multi- ‡‡‡‡½ Finder, active applications are listed on a pop-up menu. Can also launch directly to a specific document. Version 1.0. Requires 512K. Mac II and MultiFinder friendly. $59.95. ICOM Simulations, 648 South Wheeling Road, Wheeling, IL 60090. NCP (Sept '88)

PowerStation is an extremely easy-to-use, versatile and powerful Finder substi- ‡‡‡‡‡ tute. Loaded with powerful features. Comes with Pyro! $59.95. Fifth Generation, 1322 Bell Ave., Tustin, CA 92680. NCP (Dec '87)

Printworks for the Mac is a comprehensive software-based dot-matrix printer ‡‡‡‡ control system. Optimizes printing from different applications, and easy to use. Requires 512K+. $75. SoftStyle, 7192 Kalanianaole Highway, Honolulu, HI 96825. NCP (Aug '87)

Programmer's On-line Companion puts an abridged version of *Inside Macintosh* ‡‡‡ in your system for reference. Simply read the text or transfer some or all of it directly into your normal editing window. Non-Mac-ish interface makes the program confusing, somewhat difficult to use. $34.95. Addison-Wesley, Route 128, Reading, MA 01867. NCP (July '87)

Quick & Dirty Utilities, Volume One is a disk full of handy programs. Several desk ‡‡‡‡½ accessories include a menu bar clock and a terminal emulator. $39.95. Dreams of the Phoenix, P.O. Box 10273, Jacksonville, FL 32247. NCP (Nov '85) ★'85 Eddy

QuicKeys lets you make full use of your keyboard. Assign any command (menu ‡‡‡‡ choices, DAs, etc.) or series of text blocks and/or command to any key or key combination. Enormously powerful; necessary for Apple Extended Keyboard owners. Requires 512K+. $99.95. CE Software, 1854 Fuller Road, West Des Moines, IA 50265. NCP (Jan '88) ★'87 Eddy

RamSnap is a RAMdisk and disk cache in one easy-to-use package. Can store ‡‡‡‡ multiple configurations as files. Good product but a little pricey. $30. Dove Computer Corp., 1200 North 23rd St., Wilmington, NC 28405. NCP (June '87)

Read-It! is the best consumer value in optical character recognition software. ‡‡‡‡ Works with any scanner that saves images as a bit map, PICT or TIFF file. Comes with type tables that can be customized. Version 1.1. $395; ThunderScan version, $149.95. Olduvai Software, 7520 Red Road, South Miami, FL 33143. NCP (Apr '88)

Sentinel encrypts data files (or sets of files) using a super-secure DES or a super- ‡‡‡‡ fast SuperCrypt algorithm. Provides high-level security if you can keep your passwords secret. Requires 512KE. $295. SuperMac, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (Apr '88)

Smart Alarms is the best reminder system for the Mac. Easy to use, versatile, and, ‡‡‡‡½ well, smart. This self-running DA automatically reminds you of anything you enter into its Reminder file, giving you a wide range of useful advance warning options. $49.95. Imagine Software, 19 Bolinas Road, Fairfax, CA 94930. NCP (Oct '86)

SmartScrap and The Clipper are two useful desk accessory utilities for graphics ‡‡‡‡½ work. SmartScrap is a major enhancement to the standard Scrapbook DA. The Clipper provides you with a transparent Clipboard window, allow-

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ing you to resize or crop a graphic to the area that it will be pasted to. $59.95. Solutions International, 30 Commerce St., Williston, VT 05495. NCP (July '87) ★'87 Eddy

SoundWave is a useful sound recording and editing utility. Works with waveforms; ‡‡‡‡ able to change sampling rates. Previously known as SoundCap. $199.95. Impulse, 6870 Shingle Creek Parkway, Minneapolis, MN 55430. NCP (Apr '88)

Stepping Out II is a software alternative to a large-screen monitor. Lets you create ‡‡‡‡‡ a virtual screen (as large as memory allows) inside the Mac's 9-inch screen. Automatically scrolls to new document position as you type or draw. Version 2.0. Requires 1 megabyte. $95. Berkeley System Design, 1700 Shattuck Ave., Berkeley, CA 94709. NCP (Oct '88)

Stuffit compresses files to reduce the amount of space they take up on disk. Great ‡‡‡‡‡ for transferring documents via modem. Also joins and encrypts files. Version 1.5. Requires 512KE. Shareware fee, $18. Raymond Lau, 100-04 70 Ave., Forest Hills, NY 11375-5133; also available on most electronic services. NCP (Dec '88)

Suitcase is a transparent program that automatically lets you use all your fonts ‡‡‡‡‡ and DAs. Foolproof and indispensible. Comes with Pyro!, the best screen saver. Requires 512K+. $59.95. Fifth Generation, 1322 Bell Ave., Tustin, CA 92680. NCP (Nov '87) ★'87 Eddy

SuperLaserSpool is a LaserWriter spooler. Very fast because it does conversion ‡‡‡‡ to PostScript in the background, but doesn't print a faithful rendition of PageMaker documents as a result. $149.95 single user, $395.95 for up to five users on one network. SuperMac Software, 950 N. Rengstorff Ave., Mountain View, CA 94043. NCP (June '87)

Symantec Utilities for Macintosh (or SUM) reduces worries about losing data. It ‡‡‡‡‡ prevents, diagnoses, and if required, fixes many serious disk and file problems. Recovers lost files on crashed hard disks. Version 1.0. Requires 512KE. $99.95. Symantec, 10201 Torre Ave., Cupertino, CA 95014. NCP (Sept '88)

Tempo II is a powerful keyboard macro program that gives owners of extended ‡‡‡‡½ keyboards their money's worth. Especially good for building sequential macros. Features include conditional branching and the ability to remember menu selections by name. Version 1.0. $149.95. Affinity Microsystems, Ltd., 1050 Walnut St., Suite 425, Boulder, CO 80302. NCP (Dec '88)

Top Desk is a set of seven self-installing (and self-removing) DAs. Menu Key adds ‡‡‡‡½ Command key sequences to programs; View allows looking at and moving data between up to eight MacWrite documents; also included are BackPrint, Touch 'n' Go, Blank, Encrypt, and Launch. $59.95. Cortland Computer, P.O. Box 9916, Berkeley, CA 94709. NCP (May '86) ★'86 Eddy

TMON is the debugger for the Mac. This isn't open to question. TMON is simply the ‡‡‡‡‡ best. Comes with the latest version of Darin Adler's Extended User Area. $149. ICOM Simulations, 626 Wheeling Road, Wheeling, IL 60090. NCP

Twelve-C Financial Desk Accessory brings all the power and functionality of a ‡‡‡‡ Hewlett-Packard 12C programmable calculator to your desktop. Can be programmed and all registers can be viewed while calculator is running. $49.95. Positive Works, 142 Cone Road, Ormond Beach, FL 32074. NCP

TypeNow is a desk accessory that allows the Mac and ImageWriter to function as ‡‡‡‡ an electronic typewriter. Type can be placed into blanks in complex forms easily. Typing can be recorded and played back. $39.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (Jan '86)

WorksPlus Command lets you build and define macros for all Works modules. ‡‡‡‡ Predefined macros provide for an even tighter integration of the program's word-processing, spreadsheet, and database modules. Requires 1 megabyte+. $99.95. Lundeen & Associates, P.O. Box 30038, Oakland, CA 940604. NCP (May '88)

LANGUAGES

AAIS Prolog is a fast standard Prolog with excellent debugging and error handling. ‡‡‡‡ Good for serious program development. Documentation is not as good as the program. $150. Advanced AI Systems, P.O. Box 39-0360, Mountain View, CA 94039-0360. NCP (Mar '87)

Acknowledge lets advanced programmers create customized applications that ‡‡‡‡½ will accomplish many telecommunications tasks — from automatically picking up E-mail to communicating with VAXs. Version 1.0. Requires 512KE. $495. SuperMac Technology, 295 N. Bernardo Ave., Mountain View, CA 94043. NCP (Jan '89)

Allegro Common LISP's development environment is a full EMACS style editor ‡‡‡‡‡ called FRED that implements most Common LISP editing and debugging functions. Version 1.2. Requires 1 megabyte and a hard drive. $600. Coral Software, P.O. Box 307, Cambridge, MA 02142. NCP (Nov '88)

Aztec C is a C language that will appeal to users with a UNIX background. It uses ‡‡‡‡ many UNIX conventions and in the more expensive versions comes with standard UNIX utilities, including the VI editor. $75 beginners, $199 basic system, $299 development system, $499 commercial system. Manx Software Systems, P.O. Box 55, Shrewsbury, NJ 07701. NCP (May '86)

Basic Compiler is the long-awaited compiler for Microsoft BASIC. The interface is ‡‡‡½ unfriendly, but it gets the job done. Compiled programs run faster, but you can still tell they are written in BASIC. $195. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. NCP (May '87)

ExperCommon Lisp is a LISP development system. Not fully Common LISP compatible, ‡‡‡ but creates good compiled code and stand-alone applications. Requires 1 megabyte+. $995. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. NCP (Aug '87)

ExperLISP is a useful programming language for high-level programmers. The ‡‡‡ more you use it, the more you'll figure out about it. $495. Requires 512K+. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. CP

ExperLogo is a version of the popular teaching language, Logo. Features three-‡‡‡ dimensional graphics using "bunnies" rather than the usual "turtles." Very speedy, smooth program. Comes with an excellent manual. $149.95. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. CP

ExperProlog II is a Prolog based on the new Prolog II standard. Has the ability to ‡‡‡ handle infinite trees and allows user-defined functions that operate conditionally. Documentation is not the best and Mac interface is nonstandard. $495. ExperTelligence, 559 San Ysidro Road, Santa Barbara, CA 93108. NCP (Mar '87)

LPA MacProlog is a much improved program that includes incremental and optimizing ‡‡‡‡ compilers, a graphics environment package, and C and Pascal submodules. Version 2.0. Requires 1 megabyte+. $495. Programming Logic Systems, 31 Crescent Drive, Milford, CT 06460. NCP (Feb '88)

Mac C is a good, highly Mac-oriented implementation of this popular development ‡‡‡‡ language. Assembler and linker included. $425. Consulair, 140 Campo Drive, Portola Valley, CA 94025. NCP ★'85 Eddy

MacExpress is a development environment or shell. Programmers use it to save ‡‡‡ time and effort when developing stand-alone applications for the Mac. $195. ALSoft, P.O. Box 927, Spring, TX 77383. NCP (Feb '86)

MacForth Plus is an excellent implementation of the popular Forth programming ‡‡‡‡ language. New, reduced price; $199. Creative Solutions, 4701 Randolph Road, Rockville, MD 20852. NCP

Mach II is a multitasking implementation of Forth that allows local variables and ‡‡‡‡ text files. Can create stand-alone applications. Several windows can be up with different operations in each, operating concurrently. Execution is fast. $99.95. Requires 512K+. Palo Alto Shipping, P.O. Box 7430, Menlo Park, CA 94026. NCP (Apr '86)

Macintosh 68000 Development System is a fairly traditional assembly language ‡‡‡‡ package. The two-disk set provides an editor (Edit), an assembler, a linker, an executive, and a resource compiler. $195. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. NCP

MacScheme is a LISP dialect with "artificial intelligence" capabilities. Has a large ‡‡‡ appetite for RAM. Interpreted language with Toolbox access limited to a small part of QuickDraw. $125. Semantic Microsystems, 4470 S.W. Hall St., Beaverton, OR 97005. NCP (June '86)

MacScheme+Toolsmith is a Mac version of Scheme, a LISP dialect. Beautiful ‡‡‡‡‡ implementation, marred only by relative slowness compared to similar products. Get Toolsmith. Requires 1 megabyte+. $395. Semantic Microsystems, 4470 S.W. Hall, Beaverton, OR 97005. NCP (Aug '87)

Microsoft BASIC was the Mac's first programming language. This interpreter (it's ‡‡‡‡ not a compiler) now supports the Toolbox and the whole Mac interface can be implemented in your programs. For nonprogrammers, there are lots of programs available. $99. Microsoft, 16011 N.E. 36th Way, Redmond, WA 98073-9717. NCP ★'85 Eddy

MIDIBasic is a library of simple, but highly useful routines for writing MIDI software. ‡‡‡‡ Good stuff. Sketchy documentation. Works with both Microsoft and ZBasic. Requires 512K+ plus BASIC. $49.95. Altech Systems, 831 Kings Highway, Shreveport, LA 71119. NCP (Aug '87)

Object Logo is an object-oriented programming language with access to the ‡‡‡‡ Toolbox. Good product, but can't produce stand-alone applications. Requires 512K+. $79.95. Coral Software, P.O. Box 307, Cambridge, MA 02142. NCP (Aug '87)

Personal Prolog is an inexpensive and well-documented program. Has no debugging ‡‡‡‡ or search and replace facilities, making it a more appropriate tool for learning than development. Documentation and use of Mac interface are excellent. $64.95. Optimized Systems Software, 1221 B Kentwood Ave., San Jose, CA 95129. NCP (Mar '87)
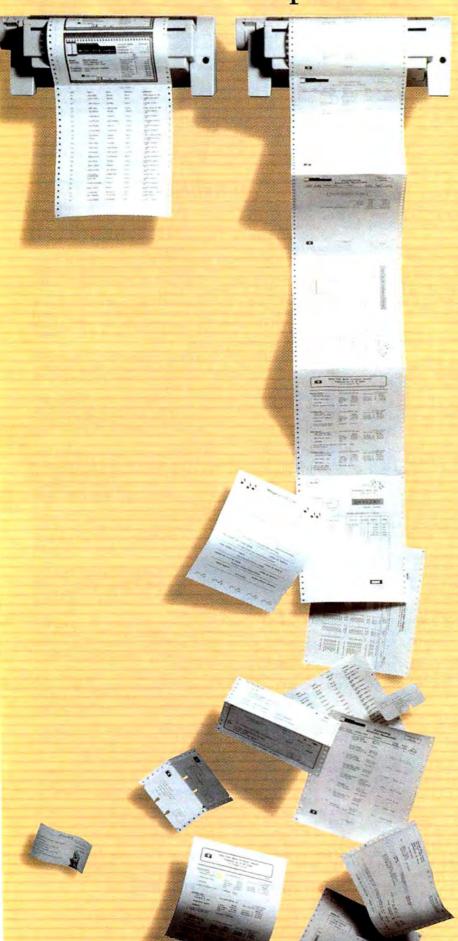
Prolog/m is a solid Prolog following the Edinburgh standard. Has extensive debugging ‡‡‡‡ facilities, but you'll need a separate Toolbox disk with 58 additional predicates. Drawback: no true editing or printing facilities. $99.95. Chalcedony Software, 5580 La Jolla Blvd., La Jolla, CA 92037. NCP (Mar '87)

QUED (Quality Editor for Developers) is the ultimate source code editor. Loaded ‡‡‡‡ with useful and well-thought-out features, it will make any programmer's life much easier. It is not a word processor, however. $65. Paragon Concepts, 4954 Sun Valley Road, Del Mar, CA 92014. NCP (Mar '86)

THINK's Lightspeed C features rapid turnaround time for development and testing ‡‡‡‡½ of programs by the use of an integrated compiler, linker, and editor. Source-level debugger steps through your code line by line to examine

the values of variables. Version 3.0. Requires 2 megabytes RAM. $175. Symantec, 10201 Torre Ave., Cupertino, CA 95014. NCP (Jan '89)

THINK's Lightspeed Pascal is a fast, powerful development system for Pascal
★★★★★ programming. Fully integrated Mac-like environment. Requires 512K+. $125. Symantec, 10201 Torre Ave., Cupertino, CA 95014. NCP (Feb '87)

TML Data Base Toolkit is an ISAM type database that provides fast and efficient
★★★★ administration of large data files in applications developed with TML compiler. Supports multiple open index files. $89.95. TML Systems, 4241 Bay Meadows Road, Jacksonville, FL 32217. NCP (Dec '86)

TML (MacLanguage Series) Pascal is a good Pascal compiler, capable of produc-
★★★★★ ing stand-alone programs. Can use most existing Lisa Pascal programs with only slight modification. Requires 512K+. $99.95. TML Systems, 4241 Bay Meadows Road, Jacksonville, FL 32217. NCP (June '86) ★'86 Eddy

TML Source Code Library shows how to write programs that use custom defini-
★★★★½ tion routines, speech, serial drivers, split bars, and other topics. Provided on three 400K diskettes. Requires TML Pascal. $79.95. TML Systems, 4241 Bay Meadows Road, Jacksonville, FL 32217. NCP (Dec '86)

Visual Interactive Programming is a unique visual programming system for cre-
★★★★ ating simple Macintosh applications. Programs are constructed in a flowchart-type manner. Easy access to most toolbox routines. $149.95. Mainstay, 5311-B Derry Ave., Agoura Hills, CA 91301. NCP (June '87)

ZBasic is a fast, interactive compiler capable of creating stand-alone applications
★★★★ that take advantage of Mac's unique features and abilities. Includes Edit, RMaker and MacInTalk. Requires 512K+. $89.95. Zedcor, 4500 E. Speedway Blvd., Tucson, AZ 85712. NCP (Dec '86)

EDUCATION

Alphabet Blocks teaches prereaders the letters and sounds of the alphabet. The
★★★★★ digitized voice of an on-screen elf is clear and pleasant. Very intuitive. Requires 1 megabyte +. $59.95. Bright Star Technology, 14450 N.E. 29th Place, Bellevue, WA 98007. NCP (May '88)

American Discovery is an interactive United States geography game that teaches
★★★ states, capitals, and, in a roundabout manner, postal codes. Suffers from small maps. Requires 512K+. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (May '88)

Business Simulator is a training tool in a simulation game. Make decisions that
★★★★ manage the company through several stages over 25 years. Decisions become more difficult over time. Requires 1 megabyte +, two disk drives (one must be 800K). May be run from a hard disk. $69.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. NCP (Dec '87)

ChipWits is a combination game and teaching tool. Players create programs to
★★★½ maneuver robots through a set of eight mazes. The programs are written in ChipWit's built-in icon-based programming language (IBOL). $49.95. BrainPower, 24009 Ventura Blvd., Calabasas, CA 91302. NCP ★'85 Eddy

Course Builder creates stand-alone educational applications. An easy-to-learn dedi-
★★★★ cated programming language uses blocks and arrows. Graphics, animation and sound can be integrated. Version 2.0 allows mathematical calculations. Poor documentation. $395, plus $10 shipping. TeleRobotics International, 8410 Oak Ridge Highway, Knoxville, TN 37931. NCP (Oct '87)

KidsTime is a package of five quality educational programs for children between
★★★★ the ages of 3 and 12. The programs all have adjustable difficulty levels. Some use speech and one is a nice introduction to musical notes. Sparse documentation. $49.95. Great Wave, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Oct '86) ★'86 Eddy

LXR-Test generates tests from a database of questions. Makes it easy to modify
★★★★ and scramble test questions. Flexible output. Requires Mac 512KE+, two 800K drives, or a hard-disk drive. $199 or $399, depending on features. Logic eXtension Resources, 9651 Business Center Drive, Rancho Cucamonga, CA 91730. NCP (May '88)

Mavis Beacon Teaches Typing! has more features than a Selectric. Lots of
★★★★ diagnostics concerning typos. Incomplete docs. Version 1.1. Requires 1 megabyte. $49.95. Software Toolworks, 1 Toolworks Plaza, 13557 Ventura Blvd., Sherman Oaks, CA 91423. CP (Nov '88)

On Becoming a Desktop Publisher is a video training tape based largely on the
★★★★ syndicated television program, "The Computer show." Good primer on the fundamentals of DTP products. Will eventually become dated. Requires Beta or VHS VCR. $49.95. Ocean Communications, 1641 North First St., Suite 160, San Jose, CA 95112. (Sept '88)

Reader Rabbit teaches 4-to-8-year olds how to read in four elegant games that
★★★★★ play and build off of each other. Requires 512KE+ and an 800K drive. Mac II and MultiFinder hostile. Version 2.0 reviewed. $59.95. The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555. CP (June '88)

Sensei Physics is a capable, intelligent, well-designed study aid. Covers Vectors
★★★★½ to Thermodynamics to The Nature of Light. Animated experiments let you try out concepts. Requires 512K+. $99.95. Broderbund Software, 17 Paul Drive, San Rafael, CA 94903. CP (Jan '88)

Type! is a typing tutorial that is both practical and flashy. It allows users to interrupt
★★★★½ and move easily between functions; however, use of the Return key or space bar are assumed but never explained. Version 1.0. Requires 512K. $29.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903-2101. NCP (Nov '88)

Typing Instructor Encore recognizes that it's being used on a word processor.
★★★★ While it is easy to control, there are some strange bugs in the program. Requires 512K. $49.95. INDIVIDUAL Software, 125 Shoreway Road, Suite 3000, San Carlos, CA 94070-2704. NCP (Nov '88)

Typing Tutor IV consistently tests your use of all keys, including seldom-used
★★★ ones. It's hard to maintain user's attention span, as the testing material is unimaginative. Requires 512K. $49.95. Simon & Schuster, One Gulf and Western Plaza, New York, NY 10023. NCP (Nov '88)

ENTERTAINMENT

The Ancient Art of War gives users a chance to refight some famous campaigns
★★★★½ on both strategic and tactical levels. Campaigns can also be designed from scratch. Very playable, addicting game. Requires 512K+ Mac. $44.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903. CP (Apr '86)

Balance of Power is the world's first computer peacegame. This simulation allows
★★★★★ players to become either the President of the United States or General Secretary of the Soviet Union. Extraordinary artificial intelligence routines and general play make this a classic. $49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60022. CP (Prem)

Battle Stations is a deceptively simple game based on the pen and paper game of
★★★★ Battleship. Requires strategy on several levels. Makes excellent use of Mac sound and graphics. Fun, casual game, especially when the Mac is one of the players. Requires 512K+. $30. Timeline, P.O. Box 60, Ypsilanti, MI 48197. NCP (June '87)

Beyond Dark Castle brings back Prince Duncan in an encore performance to run,
★★★½ jump, and beat his way to victory. But really, just more of the same. Requires 512KE. $49.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. NCP (Aug '88)

Beyond Zork is yet another installment in the famous Zork series of text adven-
★★★★½ tures. Find the fabled Coconut of Quendor to restore failing magic in this expert-level game. On-screen mapping and the Mac's window environment are utilized. $49.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140. NCP (Apr '88)

The Chessmaster 2000 is a masterful chess program that will appeal to both
★★★★★ novice and master. You can view the board from 2-D or 3-D perspective and turn the board for a better look. Play is smooth and easy, and the program responds by voice. You may get tired of hearing "Gotcha," though. $39.95. The Software Toolworks, 13557 Ventura Blvd., Sherman Oaks, CA 91423. CP (July '87)

Chuck Yeager's Advanced Flight Trainer doesn't quite have the right stuff to
★★ hold interest for long. Simplistic controls. Lacks features found in versions for other computers. Verison 1.0. Requires 512KE and two 800K disk drives. $49.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. NCP (Nov '88)

Crystal Quest combines all the good elements of nearly every video game ever
★★★★½ made. Move a piece around to gobble up points and crystals. Shoot the nasties and get through the goal before they get you. Excellent sound effects. In color on the Mac II. Requires 512K+. Greene, 15 Via Chualar, Monterey, CA 93940. CP (Apr '88)

Dark Castle is an outstanding achievement in action games which integrates
★★★★★ RealSound with superb animation and graphics. You'll need better-than-average hand/eye coordination, but it's well worth the effort. Requires 512K+. $39.95. Silicon Beach Software, P.O. Box 261430, San Diego, CA 92126. NCP (Apr '87) ★'87 Eddy

Deja Vu: A Nightmare Comes True is a graphic adventure that breaks new
★★★★★ ground. Innovative use of the Mac interface in a truly playable and exciting game. A great introduction to graphic adventure games. $49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. CP (Jan '86) ★'85 Eddy

Down Hill Racer is an action game with three skier personalities, four courses and
★★★★ four skill levels. There's something here for every player, no matter how bad or good. Full digitized sound (very nice!). $49.95. Miles Computing, 7741 Alabama Ave., Canoga Park, CA 91304. CP (Sept '87)

Falcon simulates an F-16 fighter jet with gut-tightening, sweat-making realism.
★★★★½ Go against MiGs and dodge SAMs scenarios. Requires 1 megabyte +. $49.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. NCP (May '88)

Fool's Errand is an outstanding collection of 80 puzzles woven around a mythical
★★★★★ theme of an evil priestess and the search for wisdom. Requires 512K+. $49.95. Miles Computing, 7741 Alabama Ave., Canoga Park, CA 91304. NCP (July '88)

Gato puts players in command of an American submarine in World War II. This
★★★★½ superb simulation game uses all of the Mac's graphic capabilities to really make you feel that "you are there." $49.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. CP (Nov '85)

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MINIFINDERS

GO is the Chinese equivalent of chess. Players plonk markers on a grid to gain ♣♣♣½ territory and outwit an opponent or the computer. Requires 512K+. Mac II hostile; MultiFinder friendly. Version 1.0 reviewed. $49.95. Infinity Software, 1144 65th St., Studio C, Emeryville, CA 94608. NCP (June '88)

Handwriting Analyst produces a personality profile based on answers to questions ♣♣♣♣½ about one's handwriting. It's simple and the results will amaze and astound. $49.95. Ciasa, 2017 Cedar St., Berkeley, CA 94709. NCP (Apr '88)

Klondike is a version of solitaire that uses video game-like scoring to create a ♣♣♣♣♣ superb, totally addictive game. Simple to play, nearly impossible to stop playing. Version 3.3. Shareware: $10. Unison Software, 415 Clyde Ave., Mountain View, CA 94043. NCP (Dec '87)

Leather Goddesses of Phobos is another in the long line of witty and entertaining ♣♣♣♣♣ Infocom text adventures. This one lets you choose your sex and comes with a 3-D comic and a scratch 'n' sniff card. It has three levels of play: tame, suggestive and lewd. $19.95. Infocom, 125 Cambridge Park Drive, Cambridge, MA 02140. NCP (Feb '87)

Lunar Rescue puts you in the role of a benevolent trader ready to save a moon ♣♣♣♣½ colony from invasion. Blast the enemy while you travel from town to town trading goods for the supplies you need for your mission. Version 1.0. Requires 512KE. $59.95. PCAI, 1305 Jefferson Highway, Champlin, MN 55316. CP (Jan '89)

MacGolf is a dynamic simulation of real golf. Players have a choice of courses and ♣♣♣♣½ difficulty levels. Superb playability makes this a must for all golfers and gamers. Requires 512K+. $59.95. Practical Computer Applications, 1305 Jefferson Highway, Champlin, MN 55316. CP (May '86)

Mac Pro Football is a terrific sports simulation that gives you the chance to pit any ♣♣♣♣ combination of 38 Super Bowl teams against each other and direct team play. It comes with excellent, detailed (and necessary) documentation. Play selection can get a bit Byzantine. $49.95. Avalon Hill, 4517 Harford Road, Baltimore, MD 21214. CP (Mar '87)

MacRacquetball uses digitized videos and sounds of professional players for a ♣♣♣½ realistic simulation. Has lots of control settings and can be played against someone else over a modem or between hard-wired Macs. Turn off hard disks before playing. $59.95. Practical Computer Applications, 1305 Jefferson Highway, Champlin, MN 55316. CP (Oct '87)

MSFL: Pro League Football is a professional football league simulation that ♣♣♣♣½ encourages people to play people, not the machine. Fast with lots of stats. Quirky MS-BASIC behavior. Spotty manual. No LaserWriter support. Requires 1 megabyte +. $49. MicroSports, P.O. Box 15799, Chattanooga, TN 37415. NCP (Apr '88)

NFL Challenge simulates coaching and watching professional football. Comes on ♣♣♣½ two disks, one with program and System, the other statistical data. Play against either human or computer coaching. Plays are selected from predefined playbooks. $99.95. XOR Corp., 5421 Opportunity Court, Minnetonka, MN 55343. NCP (June '87)

Patton vs. Rommel is a traditional-style strategic war game. It covers events in ♣♣♣♣ Normandy in 1944. While complex, it's well-designed and very playable. $39.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. CP (Apr '87)

Pinball Construction Set lets users create their own pinball games, as elaborate ♣♣♣♣ or as easy as desired. Uses MacPaint for backgrounds and has lifelike sounds (on 512K+ Macs). $39.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. CP (Jan '86)

PT-109 by any other name is Gato, a WWII submarine simulator also put out by ♣ Spectrum. Three-year-old technology with a minor face lift. Version 1.0. Requires 512K. Mac II friendly; MultiFinder hostile. $49.95. Spectrum HoloByte, 2061 Challenger Drive, Alameda, CA 94501. NCP (Sept '88)

Puppy Love is a combined game and teaching tool. As you teach your puppy tricks ♣♣♣♣½ and routines, you learn the basics of programming logic. Great fun for all ages. Does not run from a hard disk. $29.95. Addison-Wesley, Route 128, Reading, MA 01867. CP (Mar '87)

Quarterstaff is a fantasy adventure game of the typical "good versus evil" variety. ♣♣♣♣ Ability to use characters in other adventures gives this game a lot of potential for development. Version 1.2. Requires 1 megabyte +. $49.95. Simulated Environment Systems, 800 South Pacific Coast Highway, Redondo Beach, CA 90277. NCP (Mar '88)

Seven Cities of Gold is an educational program masquerading as an adventure ♣♣♣♣ game and is practically unique in being equally good in both respects. You are to land (not the easiest part) in the New World and attempt to placate the natives, seed a few missions and collect gold. Nice work if you can get it. $39.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. CP (June '87)

Shadowgate is an icon-based graphic adventure. You, as the seed of prophecy, ♣♣♣♣½ must save the world from the evil warlock. Far surpasses all others with great animated graphics, sound, and adventure. $49.95. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. CP (Dec '87)

Shanghai challenges players to clear a board of all 144 tiles by matching pairs of ♣♣♣♣♣ mah-jongg tiles and removing them. Terrific strategic options plus the ability to randomly generate new game boards keep this one fresh. $44.95. Activision, 3885 Bohannon Drive, Menlo Park, CA 94025. CP (Nov '86) ★'86 Eddy

Snake-Bar lets you guide a snake (or train or semi) through a maze, picking up ♣♣♣♣ objects that feed and make your snake grow. Options include changing languages, editing the maze, and an X-rated game. $15 (shareware). Georges Malmound, 37 Bis rue des Abbesses, Montmartre, 75018 Paris, France. NCP (Dec '87)

Solitaire Royale is a collection of eight solitaire card games. The Tour mode cycles ♣♣♣♣ through each game. Tournament deals the same hand for several players. $34.95. Published by Spectrum Holobyte, 2061 Challenger Drive, Alameda CA 94501. CP (May '88)

Space Quest is a three-dimensional, animated adventure in which you play a ♣♣♣♣ janitor in a dicey situation. All you have to do is get off your ship before it explodes and save the Earnon System. Runs on any Mac. $49.95. Sierra On-Line, P.O. Box 485, Coarsegold, CA 93614. CP (Sept '87)

Star Fleet I: The War Begins! is a space opera of the Star Trek variety. Rise ♣♣♣♣ through the ranks from ensign to admiral in this serialized adventure. Requires 512K+. $55. Interstel, P.O. Box 57825, Webster, TX 77598. NCP (May '88)

Strategic Conquest Plus challenges you to discover an unexplored world and con- ♣♣♣♣½ quer it by manufacturing and deploying armies, ships, and planes. A two-disk game that doesn't support an external drive. Requires 512K+. $59.95. PBI Software, 1111 Triton Drive, Foster City, CA 94404. CP (Feb '88)

Sub Battle Simulator is a superior naval combat game. Sixty different missions ♣♣♣♣ and the ability to link missions keep it from ever getting boring. Requires 512K+. $39.95. Epyx, P.O. Box 8020, Redwood City, CA 94063. NCP (Aug '87)

Trust & Betrayal: The Legacy of Siboot requires negotiating with six artificial ♣♣♣♣½ personalities in a struggle for power — not surprising considering that it comes from the maker of Balance of Power. Uses hieroglyphics to communicate in a fantasy world. Requires 512K+. Mindscape, 3444 Dundee Road, Northbrook, IL 60062. CP (Mar '88)

Ultima III allows up to four characters cooperate to explore the vast wilderness of ♣♣♣♣½ Sosaria. $59.95. Origin Systems, 340 Harvey Road, Manchester, NH 03103. CP

Uninvited is an icon-based adventure game set in an extremely haunted mansion. ♣♣♣♣♣ Graphic interface makes it easy to play. Animation and sound add to the thrill. $49.95. Mindscape, 3444 Dundee, Northbrook, IL 60062. CP (Sept '86) ★'86 Eddy

Winter Games lets up to eight players compete against each other in Olympic events ♣♣♣♣ including figure skating, bob sledding, biathlon, and ski-jumping. Excellent animation, good graphics, good theme music. $39.95. Epyx, 600 Galveston Drive, P.O. Box 8020, Redwood City, CA 94063. CP (Mar '86)

Wizardry is an outstanding dungeon exploration adventure pitting a party of up to ♣♣♣♣♣ six characters against the guardian monsters of the evil wizard Werdna. Capture his amulet to earn your reward. Even after solving the game, you'll want to go back into the dungeon. $59.95. Sir-Tech, Charlestown-Ogdensburg Mall, P.O. Box 245, Ogdensburg, NY 13669. CP

MUSIC

Alchemy loads and edits digitally sampled sounds from most commercial sam- ♣♣♣♣♣ plers. Works with 512K, but it eats up memory quickly. Requires MIDI or RS-422 interface, and sampler. $495. Blank Software, 1477 Folsom St., San Francisco, CA 94103. CP (Oct '88)

Apple MIDI Interface is a simple Musical Instrument Digital Interface with a 1 ♣♣♣ megahertz clock rate. Has only one MIDI input and one output. Works with all Macs; adaptor required for 128K and 512K. $99. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (June '88)

ConcertWare+ is an enhanced version of ConcertWare. Has different instru- ♣♣♣♣ ments and can use any four of a set of eight at any point in a piece. Supports Adobe Sonata music font. $69.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Dec '87) ★'85 Eddy

ConcertWare+MIDI is a composition and transcription program that can record ♣♣♣♣ multiple notes from a MIDI keyboard. Easy to use if you read music. Handles eight tracks of eight voices each. Requires 512K. Version 4.0. $149.95. Great Wave Software, 5353 Scotts Valley Drive, Scotts Valley, CA 95066. NCP (Dec '87)

Deluxe Music Construction Set lets you enter up to 48 voices on eight staves, ♣♣♣♣ and play the music through the Mac's internal speaker and/or via MIDI. Requires 512K+. Mac II and MultiFinder hostile. Version 2.0 reviewed. $99.95. Electronic Arts, 1820 Gateway Drive, San Mateo, CA 94404. CP (June '88)

Jam Factory is a program for performing complex manipulations on MIDI data in ♣♣♣ real time. Unique, entertaining, and very powerful, but requires lots of patience and practice. Requires 512K+, MIDI interface, and MIDI synthesizer. $189. Intelligent Computer Music Systems, P.O. Box 8748, Albany, NY 12208. CP (Oct '87)

Jam Session is a music program for those who think MIDI refers to the length of ♣♣♣♣ skirts. Without any skill, you can "Jam" with rock, jazz, rap, or country tunes. A sort of "Sing Along With Mitch" for the computer set. Requires 512K+. $49.95. Broderbund, 17 Paul Drive, San Rafael, CA 94903. CP (July '88)

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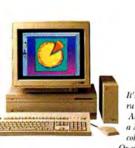
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O.K., it's true. PixelPaint puts the full repertoire of a minicomputer paint program in the palm of your hand. And it runs on the friendly Macintosh® II , making it both incredibly fast and easy to use. You just grab the mouse, point and paint. Yes, you can instantly experiment with a huge range of colors and effects. We admit it.

You can even import an image from any source by scanning it in. Then change, colorize and save it. Or, design with variable brush and pencil strokes, airbrushes, fills, drop shadows, customized palettes, and more.
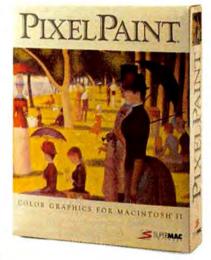
The results? Computer designs with glowing color and brilliant effects are no longer just pie in the sky.

Obviously, the word is out. So, if you've been watching computers become hot art tools, wondering when and how to get started, we suggest you visit your local computer store. Ask to see PixelPaint for yourself. It's really the easiest solution.

It's easy to run PixelPaint. All you need is a Macintosh II color system. Or expand with Mac II add-ons like SuperMac's superb big color screens and the SuperMac family of hard disk drives. Choose from a growing list of color output options, including color printers, slide makers, or service bureaus.

Listen is an educational tool for ear training. It has both a piano keyboard and a guitar fretboard for the student to input notes, and offers a wide range of exercises. $99. Resonate, P.O. Box 996, Menlo Park, CA 94026. (Jan '87)

M is a music composition and creation program that works with MIDI data in real time. Unique, entertaining, and very powerful, but requires lots of patience and practice. Requires 512K+, MIDI interface, and MIDI synthesizer. $219. Intelligent Computer Music Systems, P.O. Box 8748, Albany, NY 12208. CP (Oct '87)

Master Tracks Pro is a full-featured, second-generation MIDI sequencer that adheres to the Mac interface very well. It's the first program to have graphic-controller editing. Needs patch chasing for professional use, but it's still a rock-solid program. $350. Passport Designs, 625 Miramontes St., #103, Half Moon Bay, CA 94019. CP (Dec '87)

MIDIBasic is a simple, but highly useful routine for writing MIDI software. Good stuff. Sketchy documentation. Works with both Microsoft and ZBasic. Requires 512K+ plus Basic. $49.95. Altech Systems, 831 Kings Highway, Shreveport, LA 71119. NCP (Aug '87)

Music Mouse is a music program in a genre all its own. Called an "intelligent instrument," Music Mouse gives you instant musical feedback as you move the mouse and type on the keyboard, which controls tempo, vibrato, volume, etc. $59.95. OpCode Systems, 444 Ramona St., Palo Alto, CA 94301. NCP (May '87)

Performer is the definitive MIDI sequencer, and is priced accordingly. Includes looping, SMPTE synching, 32 simultaneous Ins and Outs, unlimited overdubbing, and compatibility with Professional Composer for transcription. Version 2.2. Requires MIDI interface and 512K+. $395. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP (Jan '88)

Practica Musica uses an interactive game and practice approach to teach music theory and ear training. Excellent training tool for the serious music student, it is also fun for anyone who wants to develop a trained ear for intervals, chords, and melodies. Requires 512K+. $125. ARS Nova Software, P.O. Box 40629, Santa Barbara, CA 93140. NCP (Nov '87) ★'87 Eddy

Professional Composer produces performance-quality sheet music using Adobe's Sonata font. Scores can be created from scratch or imported from Performer (and can be exported to Performer for MIDI playback). Requires 512K+. $495. Mark of the Unicorn, 222 Third St., Cambridge, MA 02142. CP (Jan '88)

Softsynth creates sounds for additive synthesis samplers. Downloading from Mac to sampler is time consuming. Requires 512K, sampler, MIDI interface. $295. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. CP (Oct '88)

Sound Designer set the standard for editing samples on lower-cost samplers, but it still lacks real-time high-fidelity playback. Requires 512K, sampler, MIDI interface. Emax, E II, 2000/2002, DSS-1, S900, $495; all others, $395. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. CP (Oct '88)

Studio Session consists of two programs, an Editor, and a Player, that produce music with six voices of digitized sound. Excellent program plus good manual make this a good buy. $89.95. Bogas Productions, P.O. Box 6699, Terra Lina, CA 94903-0699. NCP (Aug '87) ★'86 Eddy

Turbosynth creates sounds for a digital sampler using modular synthesis techniques. Good harmonic spectral inverter. Lacks an easy method of multi-sampling. Requires 1 megabyte, sampler, MIDI interface. $349. Digidesign, 1360 Willow Road, Suite 101, Menlo Park, CA 94025. CP (Oct '88)

UpBeat turns the Macintosh into a front panel for a highly complex and versatile drum machine. Input patterns with mouse, MIDI keyboard, or drum machine. Requires 512K. $150. Intelligent Music, P.O. Box 8748, Albany, NY 12208. CP (May '88)

HARDWARE & ACCESSORIES

AppleCD SC reads CD-ROM optical discs that contain up to 656 megabytes of data. Also plays audio CD discs. Reads High Sierra format, an industry standard for CD-ROM. Requires SCSI port. $1,295. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Dec '88)

AST TurboScan is a 300 dpi scanner with sophisticated graphics software. Scans at resolutions from 72 to 300 dpi. Super-Scan software offers halftone, line art, and mixed modes. "Virtual memory processing" lets you scan images too large to fit in RAM. $1,899. Requires 512K+. SuperScan software included. AST Research, 2121 Alton Ave., Irvine, CA 92714. NCP (Nov '87)

Classic Professional Graphics Display is a low-cost color monitor for the Mac II. Good value, but has an IBM-look about it. Green tint is annoying. Requires Apple video card. $549. Classic Components, 1490 Artesia Blvd., Gardena, CA 90247. (June '88)

CMS S-140 SCSI Hard Disk is a very fast, high-capacity SCSI hard disk with a unity interleave and average access time of 18 milliseconds. Holds 140 megabytes. Help, file transfer, and tape back-up commands built-in.

Hard Disk Partition is a useful DA. Comes with a 6-foot SCSI cable. $2,995. CMS Enhancements, 1372 Valencia Ave., Tustin, CA 92680. (July '87)

ColorVue SE is a video processor board for the Mac SE that lets you display 16 colors on an exernal RGB monitor. Slows up performance. $695. Orchid Technology, 45365 Northport Loop West, Fremont, CA 94538. (Oct '88)

DASCH is an external RAM disk available in ½-, 1-, and 2-megabyte sizes. Connects to a serial port. Speeds up operations 200 to 300 percent. Can be used as a printer buffer. Works with all Macs. 512K, $395; 1M, $450; 2M, $545. Western AutomationLaboratories, P.O. Box 3438, Boulder, CO 80307. (Feb '87)

DATA-PAK is a 45-megabyte removable Winchester hard disk. Great for backing up your main hard disk or transporting large amounts of data between office and home. Requires SCSI connector and system 4.1/5.5 or later. Drive, $1,799.95; cartridges, $149.95 each or tri-pack for $419.95. MASS MICRO Systems, Inc., 550 Del Rey Ave., Sunnyvale, CA 94086-3258. (Jan '89)

DaynaFile hooks up to a SCSI drive to read MS-DOS disks in the Mac environment. Use Mac applications to manipulate data created with an IBM PC. Comes in both 5.25 and 3.5 inch formats. $595 for single floppy. Dayna Communications, 50 S. Main St., Fifth Floor, Salt Lake City, UT 84144. (Jan '88) ★'87 Eddy

DEST PC Scan 2000 is an 8-bit scanner that saves images in up to 256 levels of gray. Can be configured for IBM PCs. Requires 1 megabyte. Scanner, $1,495; Publish Pac software, $595; OCR text processor card, $995. DEST Corporation, 1201 Cadillac Court, Milpitas, CA 95035. NCP (Dec '88)

Felix is an optical-tracking graphics tablet that replaces a mouse. Precision mode gives pixel-by-pixel control. Doesn't collect dirt like a mouse does. The 6-inch square device is designed primarily for right-handed people. Works with Mac Plus. $149. Lightgate, 6202 Christie Ave., Emeryville, CA 94608. (Sept '88)

Grappler LQ hooks Macs up to parallel laser and 24-pin letter-quality printers. A cable, driver software, and special fonts combine to make dozens of once-unfriendly printers now compatible with the Mac. Requires 1 megabyte and a parallel printer. $149. Orange Micro, 1400 North Lakeview Ave., Anaheim, CA 92807. (Nov '88)

Hard Disk 20SC is Apple's 20-megabyte SCSI hard disk. Reliable, fairly noisy unit. Good utility software, but no back-up yet. Requires cable and terminator ($80). Requires SCSI port, 512K+, new ROM. $1,299. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Feb '87)

Hewlett-Packard ColorPro Graphics Plotter is an eight-pen desktop plotter that requires third-party software to drive it. Fonts are limited to an optional Graphics Enhancement Cartridge that requires some BASIC programming. $1,295. Hewlett-Packard, 16399 W. Bernardo Drive, San Diego, CA 92127. (Feb '88)

HyperDialer provides an interface between a phone and your Mac so you can "dial" a number using one of the Rolodex-type programs, like SideKick, Focal Point or QuickDex. Hooks up between the Mac's sound port and a telephone handset. Requires 128K. MultiFinder friendly. $39.95. DataDesk International, 7651 Haskell Ave., Van Nuys, CA 91406. (Sept '88)

ImageMaker shoots 35mm color slides direct from the Mac. Supports most presentation software. Uses patterns to represent colors. Not fully compatible with the Mac II. Requires 512K+. $4,995. MacDriver software, $149. Presentation Technologies, 743 North Pastoria Ave., Sunnyvale, CA 94086. (Feb '88)

ImageWriter LQ outputs letter-quality text and graphics at 216 dpi. To do so, it reduces 72-dpi screen fonts to a third of their actual size. Takes a lot of memory. Printer Driver Version 2.0. Requires 1 megabyte and large font sizes. $1,400. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (Jan '89)

IS/ONE tablet with **Penworks** software lets you use a corded or cordless pen or mouse and a high-res tablet for precise graphics input. Minor bugs with some applications and DAs. Keystroke macros can be launched from the tablet. Minimal documentation. Requires 1 megabyte +. $595 to $1145. Kurta, 4610 S. 35th St., Phoenix, AZ 85040. (Jan '88)

Jasmine Direct Drive 50 is a very quiet 1:1 interleave 50-megabyte hard drive and one of the fastest SCSI drives around. A small fan keeps it cool, but it's still quiet. $1,159. Jasmine Technologies, 555 De Haro St., San Francisco, CA 94107. (Mar '88) ★'87 Eddy

LaserWriter II NT is Apple's mid-priced PostScript laser printer. It's faster than the LaserWriter Plus, with blacker blacks. Gray scale is less even than that of Plus. Requires 512K+. $4,599. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (May '88)

Laser Writer II NTX is Apple's top-of-the-line PostScript laser printer. 68020 chip makes it very speedy; expandable to 12 megabytes; SCSI hard disk can be attached for fonts. Requires 512K+. $6,599. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (May '88)

MINIFINDERS

LaserWriter II SC is Apples's low-end QuickDraw laser printer. Can be upgraded to NT or NTX; reasonably fast. Requires 1 megabyte +. $2,799. Apple Computer, 20525 Mariani Ave., Cupertino, CA 95014. (May '88)

MacADIOS II is a hardware and software interface for laboratory instruments. Standard configuration samples up to 142 kilohertz. Documentation is sketchy. $1,290 for Macintosh II-ready data acquisition card; $600 for MacADIOS II software interface. GW Instruments, 264 Msgr. O'Brien Highway, Cambridge, MA 02141. (July '88)

MacBottom 45 SCSI and Internal Modem has a modem that fits into the top half of the 45-megabyte SCSI hard-drive case. Comes with HFS Backup and Eureka. $1,795. PCPC, 4710 Eisenhower Blvd., Tampa, FL 33634. (Oct '87)

MacBottom HD21 is a very low (about 2 inches high), external 20-megabyte hard drive. Fits under the Mac. Very quiet, very reliable. Good utility software, including HFS Backup. Requires SCSI port, 512K+, new ROM. $1,195. PCPC, 4710 Eisenhower Blvd., Tampa, FL 33634. (Feb '87) ★'86 Eddy

MacIntizer is a graphics tablet and absolute positioning device that replaces the mouse. Various scales are possible. $599. GTCO Corp., 7125 Riverwood Drive, Columbia, MD 21046.

MacLarger is a 12-inch external monitor for 512K machines on up to the SE. Displays the same number of pixels as an internal monitor, only one-third larger. Bigger and brighter, but less crisp than the Mac's own screen. $449. Power R, 1606 Dexter Ave. North, Seattle, WA 98109. (Apr '88)

MacPacq transforms the Macintosh into a digital oscilloscope, waveform generator, and chart recorder. PacqManager is software expandable via external routines in Turbo Pascal and other languages. Version 1.03 reviewed. $995. Biopac Systems, 42 Aero Camino, Goleta CA 93117. NCP (July '88)

MacRecorder is an easy-to-use sound digitizer. Includes software to turn sounds into HyperCard buttons, mix sounds, add special effects, and convert sound formats. Stereo recording possible on a Mac II. Requires 512K+. $199. Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704. NCP (June '88)

MacSnap Plus 2 is a 2 megabyte memory upgrade for the Mac Plus. The board has 256 kilobit chips. User installable. Not compatible with existing big screens or internal hard disks, and can't be expanded further. $729. Dove Computer, 1200 N. 23rd St., Wilmington, NC 28405. (June '87)

MacTable is an elegant Danish worktable that holds a Mac and printer with room to spare. The 30-inch deep by 60-inch wide table is made of particleboard and must be assembled. Cabinet is optional. Table, $289; cabinet, $139. ScanCoFurn, P.O. Box 3217, Redmond, WA 98073-3217. (Mar '88)

MacTablet is a stylus-driven graphics tablet. Users can easily sketch or trace art using this absolute-positioning device. Has a working area the size of the Mac screen. Allows concurrent use of the mouse. $495. Summagraphics Corp., 777 State St. Extension, Fairfield, CT 06430. (Jan '86)

MacTilt/MacTilt SE is a Mac (and external drive) holder that allows a full range of swiveling and tilting. Very strong, this well-made unit is also very easy to use. $99.95. Ergotron, P.O. Box 17013, Minneapolis, MN 55418.

MacVision is a digitizer that uses an ordinary video camera for input. Capable of extremely fine results and special effects. Easy to use and well-documented. $349.95. Koala, 269 Mount Hermon Road, Scotts Valley, CA 95066.

Mac-101 is a keyboard alternative that has a good feel to it. Has a keypad, 15 function keys, and more. The 101-Keys desk accessory lets you define macros. Comes in an ADB version for the SE and II. Requires 512K+. $169.95. DataDesk International, 7650 Haskell Ave., Van Nuys, CA 91406. Software NCP (Apr '88)

Magic Digitizer is a hardware digitizer that works with video cameras. With Laser-Magic software you can generate 300 dpi images (in PostScript). Requires 512K+. Digitizer with Magic software, $399.95; LaserMagic software, $49.95. New Image Technology, 10300 Greenbelt Road, Seabrook, MD 20706. NCP (May '87)

Microtek MSF-300C is a 300-dpi flatbed scanner. Really fast when used with optional MS-SCSI/C adapter. Comes with Versa-Scan Plus software (NCP) to scan and manipulate image. Saves images in a number of formats including TIFF and MacPaint. $1,895. Microtek Lab, 16901 S. Western Ave., Gardena, CA 90247. (Dec '87)

Migent Pocket Modem is a 300/1200 baud portable modem about the size of a 3-x-5 index card. Comes bundled with MacTerm 2.0, Borland's telecom DA. Manual is confusing, and tech support is minimal. $259. Migent, 865 Tahoe Blvd., Incline Village, NV 89450-6062. (Nov '87)

Mouse Mover is a mouse pad-type surface that snaps onto the bottom of the mouse like a roller skate, freeing it up to glide over desk or mouse pad with ease. 99 tiny ball bearings at three strategic points. Mouse glides faster and saves on mouse wear and tear. $19.95. Magnum Software, 21115 Devonshire St., Chatsworth, CA 91311. ★'85 Eddy

Moustrak is a fabric-covered foam mousing pad. It will increase the efficiency of your mouse while helping to keep it clean. Pad comes in a variety of colors. Particularly useful in the typical office desktop environment. $10. Moustrak, 3047 St. Helena Highway, Saint Helena, CA 94574.

NetModem is a 1200-baud modem that can be accessed by all users on an AppleTalk network. The modem's display lights and the dial tone are simulated on-screen. Requires 512K+. $599. Shiva, Suite 1200, 222 Third St., Cambridge, MA 02142-9919. (Feb '88)

One Plus One is a user-installable memory upgrade for a Mac Plus. Adds 1 megabyte of RAM to the 1 megabyte already there. Simple one-evening project. Includes MacBreeze, an excellent small fan. Requires Mac Plus. $375. Levco, 6160 Lusk Blvd., San Diego, CA 92121. (Aug '87)

Personal LaserPrinter is a non-PostScript laser printer at a great price. Clumsy workarounds required in some applications. Printing can be slow. Requires 1 megabyte +. $1,999. Fonts Plus, $299. General Computer, 580 Winter St., Waltham, MA 02154. (Apr '88)

Personal Writer PW15 S is a tablet-based handwriting recognition system that also allows graphics and macros. Number of misread characters is too high for general word processing. Requires 1 megabyte +. Personal Writer, 1801 Avenue of the Stars, Los Angeles, CA 90067. Software NCP (Mar '88)

PhoneNET is an AppleTalk-compatible network. Network can be up to 3,000 feet in length. In-place, unused phone cabling can be used for network, and can be combined with AppleTalk on the same network. $59.95 per node. Farallon Computing, 2150 Kittredge St., Berkeley, CA 94704. (Dec '86) ★'87 Eddy

ProPoint replaces the mouse with an ADB trackball. Works better on the SE than it does on the Mac II. Lefties will find the button positions uncomfortable. Requires SE or Mac II. $139.95. Abaton, 48431 Milmount Drive, Fremont, CA 94538. (Oct '88)

QMS Colorscript 100 is the first color PostScript printer that uses a four-color thermal wax transfer technology. Works on AppleTalk. Excellent typographic capability. Currently supports only a handful of applications. Requires 1 megabyte. $21,995. QMS, 1 Magnum Pass, Mobile, AL 36618 (Oct '88)

QMS-PS 810 is an eight-page-per-minute, 300-dpi PostScript laser printer that competes with the LaserWriter NT. 2 megabytes of RAM is standard; upgradable to 3 megabytes. Emulates H-P LaserJet, 7475 (HPGL), and Diablo 630. $5,495. Laser Connection, 7852 Schillinger Park West, Mobile, AL 36608 (July '88)

QuickShare adds a SCSI port to an IBM PC for easy connectivity with a Mac. Can use an IBM's hard disk to run Mac applications. Requires SCSI port. Mac II and MultiFinder friendly. Version 1.24 reviewed. $465. Compatible Systems, P.O. Drawer 17220, Boulder, CO 80308. (June '88)

Radius Accelerator 25 can make your Mac SE run 50 percent faster than a Mac II. The add-in accelerator card has a Motorola 68020 CPU that runs at 25 megahertz, and an optional 25 megahertz 68881 math coprocessor. $1,695; $2,195 with optional 25-megahertz 68891. Radius, 404 East Plumeria Drive, San Jose, CA 95134. (Oct '88)

SpeedCard is an accelerator board for the Macintosh SE that more than doubles the speed of most applications. The board uses the 68000 chip found in the SE and an optional floating point 68881 chip for number crunching. Requires Macintosh SE. $399; $699 with coprocessor. SuperMac Technology, 295 North Bernardo Ave., Mountain View, CA 94043. (Nov '88)

SuperRam 2 and SuperRam 4 are 2- and 4-megabyte RAM upgrades. Should be dealer installed but can be (carefully) user installed. SuperRam 2 includes RAM adaptor module, 1-megabyte memory module, modified power cable, jumper and fan. SuperRam 4 adds power supply booster and two 1-megabyte memory modules. Not compatible with most big screens. $499. SuperMac Technology, 295 N. Bernardo, Mountain View, CA 94043. (Oct '87)
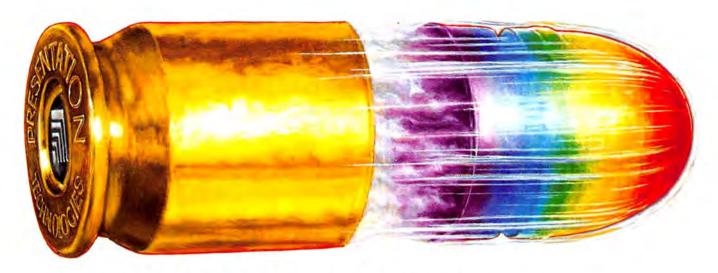
Tektronix 4693D Color Printer is a 300 dpi bit-mapped color printer. Colors look smooth and rich. Uses bit-mapped screen fonts; most type has noticeable jaggies. Requires Mac II with color monitor. Recommended 8-megabyte configuration. $11,490. Tektronix, P.O. Box 500, Beaverton, OR 97077. (Oct '88)

ThunderScan replaces the ribbon cartridge in an ImageWriter, which is required to use it. Laser scans art that can be run through the ImageWriter, producing high-quality digitized images. The images can be manipulated as they are created or afterward. $249. Thunderware, 21 Orinda Way, Orinda, CA 94563. ★'85 Eddy

TimeWand is a bar-code reader with a built-in time/date stamping clock. Can be used with TimeWand Manager software, a database that's extensive though difficult to use. Poor docs, but good support. Requires 1 megabyte +. TimeWand 2K version, $198; TimeWand Manager, $489. Videx, 1105 N.E. Circle Blvd., Corvallis, OR 97330-4285. (Oct '87)

TV Producer is an add-in card that overlays Mac graphics and text onto a video signal. Software is clumsy to use. Requires Mac II, Apple video card, and video souce. $599. Computer Friends, 14250 N.W. Science Park Drive, Portland, OR 97229. Software NCP (May '88)

V-series Smartmodem 9600 is the fastest modem you can get for the Mac. To achieve high speeds, you'll need a special cable and software that supports the format. Requires 512KE, Mac-to-modem cable, and communications software. $1,299. Hayes Microcomputer Products, 705 Westech Drive, Norcross, GA 30092. (Jan '89)

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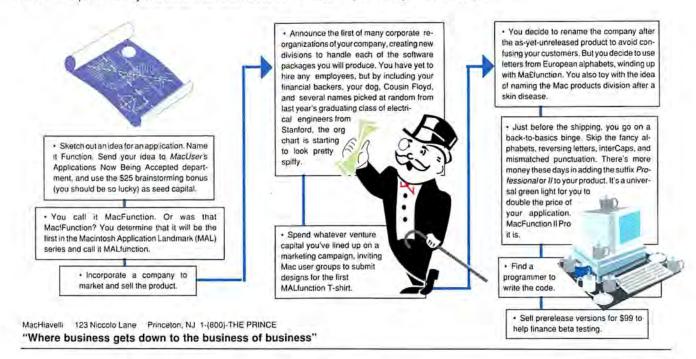
AD INDEX

There are plenty of guides to success out there. If it's not Donald Trump telling you how to step on the other guy on your way to the top, then it's Lee Iacocca explaining how to turn a losing company into a winner — and offering advice (mostly unsolicited) about subjects other than business. But for Mac-specific business acumen, turn to MacHiavelli, the only software package that shows you the ins and outs of this crazy little thing we like to call the Macintosh industry. The numerous modules included — like this handy flowchart — will put you on top in no time, guaranteed.

• Sketch out an idea for an application. Name it Function. Send your idea to *MacUser*'s Applications Now Being Accepted department, and use the $25 brainstorming bonus (you should be so lucky) as seed capital.

• You call it MacFunction. Or was that Mac!Function? You determine that it will be the first in the Macintosh Application Landmark (MAL) series and call it MALfunction.

• Incorporate a company to market and sell the product.

• Announce the first of many corporate reorganizations of your company, creating new divisions to handle each of the software packages you will produce. You have yet to hire any employees, but by including your financial backers, your dog, Cousin Floyd, and several names picked at random from last year's graduating class of electrical engineers from Stanford, the org chart is starting to look pretty spiffy.

• Spend whatever venture capital you've lined up on a marketing campaign, inviting Mac user groups to submit designs for the first MALfunction T-shirt.

• You decide to rename the company after the as-yet-unreleased product to avoid confusing your customers. But you decide to use letters from European alphabets, winding up with Ma£lunction. You also toy with the idea of naming the Mac products division after a skin disease.

• Just before the shipping, you go on a back-to-basics binge. Skip the fancy alphabets, reversing letters, interCaps, and mismatched punctuation. There's more money these days in adding the suffix *Professional* or *II* to your product. It's a universal green light for you to double the price of your application. MacFunction II Pro it is.

• Find a programmer to write the code.

• Sell prerelease versions for $99 to help finance beta testing.

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SCRaPBOOK

EDITED BY KRISTI COALE AND JON ZILBER

MAC ON THE STREET

T. Smythe Richbourg of Asheville, N.C., liked our DAs of the Rich and Famous (October '88), but he thinks we left some out. For starters, there's Mac La-Lanne: "When you open it, it bounces all over the screen and can't be held down to close it. And as for Dirty Harry, Clint Eastwood's favorite DA, it talks tough, but then launches you into the depths of that terminal deficit spreadsheet, Polotix!"

The repercussions of last August's Boston Macworld Expo are still echoing, even as we prepare for the January San Francisco installment. Correspondent Charlie Bermant, upon discovering that Informix had yet to ship its long-awaited Wingz spreadsheet — despite having given out thousands of Wingz-logoed nylon tote bags at trade shows for the previous several months — asked "Does this mean I have to give the bag back?" The tote bags have to be one of the most successful promotions ever for a nonexistent product.

Carry one on the street, and strangers shout out, "It'll never ship!" Guess the bags have held up longer than Informix's credibility.

Speaking of waiting, do you suppose Aldus held the party to celebrate its Persuasion software on the U.S.S. Constitution at the Boston Macworld Expo just so it could say the product "shipped" at the show?

Back on the show floor, Arlan Levitan stopped by the Nuvotech booth and noticed a new sticker on the TurboNet AppleTalk adapters that informed potential purchasers that the product is "Now Self-Terminating, With Limited Lifetime Warranty." So what good is a lifetime warranty if the product could self-terminate itself at any moment?

And while the Bayside Expo Center's air conditioning wasn't totally out of commission during the Expo, Arlan also suspects that "the heat and humidity on the show floor was bad enough to induce momentary lapses of higher brain function upon even veteran exhibitors. As one proudly explained to us as he demonstrated a popular graphics program for kids: 'You can see a lot of thought went into this product. It's educational, easy to use and uh . . . uhhh . . . and it makes a great night light.' " Not the best sales pitch, to be sure.

Arlan was, however, impressed with the new Liquid Crystal Shutter printer from Qume. He notes that "while most interior decorators believe that Liquid Crystal Shutters are a New Age window treatment, many hardware designers believe they may offer significant improvements in page printer reliability. According to Qume this results in print speeds typically three times faster than a LaserWriter IINT, which may account for some recent shutter-induced shudder felt in some Cupertino offices."

The most interesting press release to cross our desk this month was from Clark Boardman Company of New York. It was an announcement for the latest edition of The Directory of Intellectual Property Lawyers and Patent Agents ($145; 435 Hudson St., New York, NY 10014; [212] 929-7500). It was the headline that caught our eye: "Directory Contains Credentials of 'Look-and-Feel' Attorneys." And, no, it does not consist of the cast of "L.A. Law."

And now here's something we hope you'll really like: Don Hensley of Decision Software in Boston, Mass., is hard at work developing a new storage medium called write-only memory. It's good for things that you know you'll never, ever want to look at again, but that you can't bear to toss out. For example, Don would keep his extensive list of superprime numbers in write-only memory. (Superprimes, of course, are numbers that can't even be divided by themselves or 1.)

Address your read-only correspondence to Mac on the Street, c/o *MacUser*, 950 Tower Lane, 18th floor, Foster City, CA 94404.

— *Jon Zilber*

Filmmaker/auteur/nebbish Woody Allen recently testified before the Senate Subcommittee on Software Arts to protest the colorization of the Macintosh. Said Allen, "There are now a lot of programs falling into the public domain that unscrupulous developers are colorizing. These programs were originally developed in black-and-white and were never intended to be shown in color. This colorization ruins the artistic integrity of the original." Allen has glued his finger to his head to protest the colorization of the Mac.

— *Ben Templin*

SCRaPBOOK

CRYSTAL QUEST LEXICON

Here at the *MacUser* offices, countless hours — or months, in some cases — have been frittered away playing Crystal Quest. And even more time has been squandered trying to describe an unusual new maneuver to coworkers. So we're indebted to Douglas M. Smith of Island Computer Services, Long Beach, NC, (high score: 7,338,600/level 60) for his Crystal Quest lexicon and glossary. Here are our ten favorite new and replacement terms:

1. Dumple-Crumpler: that occasional bullet that takes out a Dumple in one shot.

2. Conga Line: being hotly pursued by three or more Parasites.

3. Slide-for-Life: a dive for the gate from the better part of the way across the screen, at least 45 degrees from the vertical.

4. Kamikazi Slide-for-life: same as above, but with a critter in your path.

5. Moon-Walking: overshooting a moving gate and trying to slide back over it to escape.

6. Hand of Death: when you occasionally die without touching a mine or getting shot, or so you claim.

7. Pre-emptus Acceleratum: the scientific term for what sometimes causes you to take off at a ridiculous speed after detonating a Smart Bomb.

8. Thorny Rose: a crystal tightly nestled among the mines.

9. Toilet Flush: critters pouring out of the portals.

10. Over the Hill: beyond level 40 (aka Never-Never Land).

11. Cold Turkey: out of Smart Bombs.

12. Just Warming Up: something you say when you get off to a really bad start and abort the game.

Well, those are 12 of our 10 favorites . . . I guess we don't have room to list some of Douglas's proposed new names for various critters (such as changing *Zarklephaser* to *Popcorn Machine* or *Worrier* to *Spitting Duck,* and there's no room to list his new names for *Smart Bombs* (*Handi-Wipes, Rolaids, Quick Fix,* or *Finger-Death*).

COLLECT 'EM ALL

Unless you're talking about guys with names like Atkinson, Gassée, and Kawasaki, most of the movers and shakers in the Mac community are about as visible as Tom Wolfe at a white sale. But thanks to MacConnection, invisibility shouldn't be a problem anymore.

In an unusual marketing ploy, MacConnection issued a set of "baseball" cards at the last Macworld Expo profiling the heads (both literally and figuratively) of many leading Mac companies. The set of cards provides a veritable who's who of Mac hardware and software. Each card features a color photo of the company president, the company's address and phone number, and a little cartoon with an appropriate witticism reflecting the president's philosophy of life. To go along with the cards, MacConnection has also published its President's Catalog, which has selected presidential photos as well as information about the company's products available by mail order through MacConnection.

The MacConnection catalog is free for the asking. The company plans to distribute the cards to its customers at a premium with catalog purchases, although details hadn't been decided at press time. You can find out more by getting in touch with Mac-Connection, 14 Mill Street, Marlow, NH 03456; (800) 622-5472.

— *Russell Ito*

If you want to know what the president of your favorite Mac company looks like, stop checking out the Post Office bulletin boards — get these nifty "baseball" cards from MacConnection.

SCRaPBOOK

'Nuff said. Get yours for $15 from CD Designs, 300 W. El Camino, Mountain View, CA 94040. Allow 3 to 6 weeks for delivery (unless legal difficulties with a certain Palo Alto computer manufacturer hold things up). — *BT*

It's not too late for software pirates to come clean with the goods. If you've been using Acta, the widely distributed outlining tool, without paying for it, then now's the time to fess up without getting punished. Acta's parent, Symmetry, is offering an amnesty program that gives you the new Acta Advantage application for the upgrade price even if you never bought the original. Just send $50 and a screen shot of the old Acta in action to Symmetry, 761 E. University Drive, Mesa, AZ 85203; (602) 844-2199. T-shirt not included. Act fast — offer ends December 31, 1988. — *Ben Templin*

PLANIT OF THE PLATES

With Planit Kitchen, you can design and redesign an entire kitchen — right down to the lighting valance. This interior-design marvel has been a reality for some time over in the United Kingdom, and it's now available in the U.S.

Intended mostly for professional designers to use in their presentations, Planit Kitchen is a CAD program specializing in kitchens. You can position units (like cabinets, stoves — even the kitchen sink!) anywhere you want and make them whatever dimensions you want. These units, along with such items as countertops, are available in a symbols library.

Users can also create their own symbols and store them in the library. When added to a kitchen, these units are measured and priced automatically — generating a price and parts list for a client. Great for the non-detail–oriented types.

Planit Kitchen, which supports color on the Mac II, comes with the design, costing, and catalog editor software and sells for $3,750 (more than some kitchens cost). Microspot also offers ImageWriter II Color Printing Software ($60), ImageWriter LQ Color Printing Software ($149), and Color Plotting Software ($199).

If you're in the mood to mentally rearrange the furniture in a room that's not the kitchen, you can try concentrating on each piece of furniture in an attempt to levitate it. But rather than straining your brain, try Microspot's Mac Interiors. Save your back from unnecessary strain by placing that dining room table in the middle with the mouse. The program lets you view and print elevations plans and perspectives. When creating furniture (which can be stored in a library), you can include up to 64 different surfaces. This low-end program sells for $295 and can be used with the Mac Plus, SE, and II (but it doesn't support color on the II).

For more information contact Microspot, 21060 Homestead Road, Cupertino, CA 95014; (408) 739-0326.

— *Kristi Coale*

HIT LIST

September means back-to-school time — when you bring teacher an Apple, don't forget the software. Here's what the Apple-polishers were picking up at Egghead Discount Software:

1. Microsoft Excel
Microsoft

2. Microsoft Word
Microsoft

3. MacDraw II
Claris

4. TOPS
TOPS

5. Symantec Utilities for Macintosh
Symantec

6. Microsoft PowerPoint
Microsoft

7. Quicken
Intuit

8. PageMaker
Aldus

9. MacWrite
Claris

10. FileMaker II
Claris

Taipei Behavior

by John C. Dvorak

As I crept through the back alleys of Taipei's clone alley looking for a Mac clone, I realized something. Not only was the Mac clone not to be found, but those infamous Apple II clones were all gone too! A week later I was in Hong Kong's even more notorious clone alley, and it was the same story. In fact, the only bootleg item I found was a Peter Norton book, and I doubt anyone realized that it was bootlegged.

The East has gone legit, and that means IBM compatibles. No matter what you read or hear, things have changed in Asia, and I'm not so sure that it bodes well for Apple.

When I arrived in Taipei that first day, I was convinced there'd be some Apple Mac clones there. I'd heard about a top-secret project to clone the Mac and at the same time avoid legal entanglements by using a programmable user interface. Forget it. Though Taiwan is still thought of as the source of worldwide bootlegging, this is no longer true. The copyright laws changed drastically two years ago, and finding even a bootleg watch in the seediest part of town is impossible. Do you want a bootleg watch or bootleg software? Try New York.

Also, Taiwan's past bootlegging of the Apple II was largely a function of the ban, years back, on public video games. The Chinese in Taiwan love video games. So they cloned the Apple II to keep playing. A couple of years ago, video games were legalized again, and now they're all over the country. All of them are sit-down models designed to be reprogrammed with the latest game. Hot right now is a game called 1943, where Taiwan pilots shoot down Japanese Zeros and bombers. Meanwhile, the Apple II is a forgotten memory.

So as I roamed around the country asking various people in the know about the bootleg Mac, I got the same answer. It goes: "Apple Corporation is an unfriendly company who will sue us. Furthermore, it's hard to clone and maintain compatibility with the next version of the Mac system. And, finally, there is too much money to be made cloning the IBM PC/XT, PC/AT, and 386 machines." This is especially true since the Chinese character sets have been

incorporated into the newest operating system modifications.

This response was uniform. If you're waiting for a Mac clone from Taiwan or Hong Kong, forget it. In Hong Kong they're too busy worrying about the lease running out in 1997 to fret over the Macintosh. The attitude there seems to be to let things slide until the turn of the century.

In Taipei I did manage to find the much-discussed Mac box that contained the innards of an IBM PC/XT. It has met with almost no success, and since it looks so much like a Mac (let's say "exactly like a Mac"), it has the vendors spooked. They think Apple will sue them for the design of the plastic! I suspect that it will disappear from the scene in favor of more mini-towers and other IBM-like boxes. The Mac XT is already a collector's item.

While all this is fine and dandy as far as the gross profits of Apple are concerned, other considerations do not bode well for the company. Developers are irritated enough with Apple over its handling of Microsoft and Windows. Mac developers are

developing for a world of computers that, while enlarging, is not expanding as fast as the world of the technologically inferior IBM PC. Many of them have already cashed in and decided to emphasize "the big market — IBM compatibles." It turns out to be more lucrative and *easier!*

Meanwhile, Apple thinks it's on a roll. Sales are up, profits look good. Heck, they even raised prices. The world of the PC still can't do what a Macintosh can do. The Apple II and its predecessors still own the educational market. What, me worry?

Worry? Absolutely. The vital forces of world creativity will abandon the Mac and its narrow market. The Mac world is doomed to the fate of the Amiga: a world hoping that program developers find it in their hearts to "port" their programs to the Mac from the IBM PC. If you think technological superiority is all it takes to succeed, then I'd advise you to look at the Amiga and tell me why only a few firms develop software for it. (Aside: The complex mechanism that accounts for success isn't helped by either the concept of greed or the notions of protective attorneys.)

What to do? What to do? First of all, Apple needs a second source for its machines, just as a semiconductor firm needs a second source for its parts. In this case, I don't mean letting Acer of Taiwan or Fujitsu of Japan make machines for Apple and glue on the Apple name. I mean licensing the Mac design to a couple of Asian suppliers for sale in other parts of the world as Mac compatibles. That's the only way that other parts of the world will get excited by the Mac. It'll make the Mac look like the hot ticket. Otherwise, Apple risks losing that all-important critical mass of user interest. For the Apple II, it's already lost in Taiwan and Hong Kong. The hopeless Mac isn't even in the picture. It's viewed as a curiosity.

The English historian Arnold Toynbee once developed theories of cultural spread that he compared to the ripple effect you see when you drop a rock in a pond. The ripples hit the edge of the pond and return. The importance of the trend is reflected by the amplitude of the returned ripple. With the Mac, there is no returned ripple. ▨

ROBERT ZIMMERMAN

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Number of open documents	Unlimited *	1	30	30
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